



TANGANYIKA TERRITORY

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# Report

of the

Department of Agriculture

for the year ending

31st March, 1926.

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DAR ES SALAAM

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# Report of the Department of Agriculture, Tanganyika Territory, for the twelve months ending 31st March, 1926.

## ESTABLISHMENT AND GENERAL ORGANISATION.

1. The Deputy Director acted as the Territory's representative at the Tanganyika Court of the British Empire Exhibition from the 1st July to the 31st October.

2. African Agricultural Instructors were employed in the various districts as follows:—

District	Maximum	Minimum
Arusha .....	4	2
Bagamoyo .....	10	7
Bukoba .....	15	4
Dar es Salaam (including Mafia).....	9	3
Iringa .....	1	1
Kigoma .....	1	1
Kilwa .....	8	7
Lindi .....	28	23
Mahenge .....	2	1
Morogoro .....	19	14
Moshi .....	12	10
Mwanza .....	19	16
Pangani .....	7	4
Rufiji .....	13	7
Rungwe .....	2	1
Tabora (including Kahama) .....	3	0
Tabora (Shinyanga Sub-district).....	19	14
Usambara .....	3	3
Total	175	118

## AGRICULTURAL INSTRUCTION AND EDUCATION.

3. The use of native instructors who are given field training by the District Agricultural Officers, assisted by demonstration in agricultural stations where this is feasible, continues to be successful, the chief conditions of this success being: the careful choice of material and prompt elimination of the unsuitable, frequent tours of duty with the Officer responsible for their work, and close control of their activity mainly by the allotment of definite duties and the use of the logbook or register of visits with the aid of chiefs and headmen. The work of the agricultural instructors received detailed description in paragraph 6 of the last Annual Report. The establishment of Government Central Schools is providing a means of supplying instructors who will have undergone training in which the theoretical basis of agriculture takes a larger place, and who will be available to assist with the more formal instruction for school gardens.

4. The direct work of the District Agricultural Officer has continued to be done at meetings of African farmers, best held on native farms and where possible at Agricultural Stations. The establishment of a system of native administration possessing its own funds used for the benefit of those in its area will enable the district agricultural work to be focussed at centres each possessing its own co-operative plots and seed-farm for improving husbandry and the plants used in it. The vernacular monthly journal *Mambo Leo* continues to be made of regular assistance, particularly for the dissemination of agricultural news and advice of general interest to natives; and the Editor of the *Tanganyika Times* continues to afford the assistance that is appreciated for acquainting non-native farmers with agricultural information intended for their help. During the year, two pamphlets each in English and Swahili were issued by the Department,



dealing with the cleaning operations necessary at the end of the cotton season and with field selection for cotton improvement.

### IMPROVEMENT AND EXTENSION OF CROP PRODUCTION.

5. The information just given outlines the activities of the Department that exist for these purposes, and some of the ways in which they will be extended. In a Preliminary Report on the Agriculture of the Territory made in 1922 it was hoped that facilities would be afforded for co-operative experimentation with non-native coffee planters in the Northern Province, and it is expected that increase of staff in that area, particularly with the appointment of a Senior Agricultural Officer for it, who possesses the special knowledge required for manurial and cultural investigations, will soon make such experimentation possible: experimentation in which the active interest and assistance of the planter are the best guarantee of success.

6. Unfortunately, as a result of an unfavourable season, the increase of production from general crops, recorded for 1924 in the last Report, was not maintained; and as is shown in the table in paragraph 69 there was a great falling-off in the export of all annual crops except cotton. As regards cotton, however, it is a matter for encouragement that it withstood the unfavourable conditions better than any other annual crop, and thus supplied the best possible evidence of its suitability to the conditions of the Territory.

7. For the improvement of cotton in the Mwanza Province (and later in Northern Tabora and probably other areas) 95 tons of guaranteed Uganda seed was presented to the Department by the British Cotton Growing Association: a form of assistance that is much appreciated. This seed, after inspection of it by the Director of Agriculture at Jinja, was increased to 500 tons for completely supplying Mwanza Province in 1926 by its being grown alone in native farms on Ukerewe Island, the cotton from it being ginned at the ginnery on the island, rented by the African Mercantile Company who willingly afforded the necessary co-operation, movement of seed-cotton either to or from the island being in the meantime prohibited. Similarly in Rufiji District the seed of what has proved to be the best of the strains raised by the Cotton Specialist of the Empire Cotton Growing Corporation (the so-called M cotton) was, with the freely-given assistance of Messrs. Frantzis and Horn on their Loge-loge plantation, increased to  $8\frac{1}{4}$  tons, from which a quantity sufficient for the needs of the whole District is expected to be raised next year. Thus  $508\frac{1}{4}$  tons of the best and improved cotton seed were raised without any expenditure on the part of Government.

8. As regards the general free distribution of cotton seed of the best grades and earliest maturity to natives, in the interests of economy and as the latter have become instructed in correct methods of sowing, this is now more strictly controlled under a system in which definite information as to requirements is obtained, and supplies are based rigidly on this information. This is the reason for the decrease for 1926 shown in the following table:—

Region	1923	1924	1925	1926
	Tons	Tons	Tons	Tons
Arusha ... ..	$2\frac{3}{4}$	1	$1\frac{1}{2}$	2
Bagamoyo ... ..	25	34	37	48
Bukoba ... ..	2	20	1	$65\frac{1}{2}$
Dar es Salaam ... ..	4	13	25	29
Iringa ... ..	—	—	$1\frac{1}{4}$	—
Kilwa ... ..	20	60	81	80
Lindi ... ..	113	160	340	208
Mahenge ... ..	3	5	$22\frac{3}{4}$	3
Morogoro ... ..	84	208	199	128
Moshi ... ..	$3\frac{1}{4}$	8	$11\frac{1}{4}$	$5\frac{1}{2}$
Mwanza ... ..	140	338	447	455
Pangani ... ..	3	8	50	47
Rufiji ... ..	70	120	164	132
Rungwe ... ..	—	—	5	—
Tabora ... ..	10	68	200	160
Tanga ... ..	$\frac{1}{2}$	2	8	$4\frac{1}{4}$
Usambara... ..	$\frac{3}{4}$	2	$\frac{1}{2}$	$\frac{1}{2}$
Total... ..	$481\frac{1}{4}$	1,047	$1,594\frac{1}{4}$	$1,367\frac{3}{4}$



9. The plantings of cotton seed by non-natives are reported to have been  $411\frac{1}{4}$  tons as compared with 442 tons in 1925, as follows :—

Region										Seed in tons
Tanga	...	...	...	...	...	...	...	...	...	12
Arusha	...	...	...	...	...	...	...	...	...	5
Bagamoyo	...	...	...	...	...	...	...	...	...	$1\frac{1}{2}$
Bukoba	...	...	...	...	...	...	...	...	...	—
Dar es Salaam	...	...	...	...	...	...	...	...	...	15
Kilwa	...	...	...	...	...	...	...	...	...	7
Lindi	...	...	...	...	...	...	...	...	...	$1\frac{1}{2}$
Mahenge	...	...	...	...	...	...	...	...	...	3
Morogoro	...	...	...	...	...	...	...	...	...	320
Moshi	...	...	...	...	...	...	...	...	...	$19\frac{1}{4}$
Mwanza	...	...	...	...	...	...	...	...	...	$\frac{1}{2}$
Pangani	...	...	...	...	...	...	...	...	...	$2\frac{1}{2}$
Rufiji	...	...	...	...	...	...	...	...	...	17
Tabora	...	...	...	...	...	...	...	...	...	—
Usambara	...	...	...	...	...	...	...	...	...	7
Total...										$411\frac{1}{4}$

10. *Ploughing*.—There are now three areas which have served as starting points for the introduction and spread of ploughing among the cattle-owning natives in the north-western region of the Territory. These are in the Districts of Mwanza, Shinyanga and Nzega. The progress has not been rapid, as there are few natives of sufficient means as yet to purchase ploughs. Encouragement of co-operative purchase and a system of local credit are relied upon for a more rapid development in the future. The scheme was commenced in 1924 and the progress to date is shown in the following table of acreages ploughed :—

	For 1925 crops.	For 1926 crops.
Mwanza	270	500
Shinyanga	1,500	2,240
Nzega	50	270

This is to be regarded as quite distinct from the ploughing being done under the scheme of settlement in areas reclaimed from bush by the Director of Game Preservation.

11. *Coffee Cultivation, Northern Province*.—Up to the present the assistance given by the Department to non-native coffee planters in this area has been mainly entomological and the publication in the local press of articles intended to be helpful to those interested in coffee; but, as is explained above, the necessary assistance of organized experimentation and other investigation is expected shortly to be made possible. In addition, legislation controlling the growing and buying and selling of coffee is contemplated; and the enactment of this will place in the hands of the Department means for protecting the coffee industry of the Province. The extension of activity under the experimentation and legislation proposed should strengthen the position of coffee planters in the Northern Province in ways that are only now becoming possible.

12. The share of the coffee industry in the Northern Province that is in the hands of the natives receives description in paragraphs 12 and 13 of the last Report. There, the formation of a Kilimanjaro Native Coffee Planters' Association was recorded, and this has now become a strong organization, possessing its own coffee nurseries and appliances and materials for loan or supply to members for dealing with pests, assisting in the work of the Department for helping and advising its members, and fostering a public opinion among natives for the careful production of good coffee. The co-operation for marketing this coffee, whose advent was anticipated in the last Report, has already become a matter of fact, and it is now graded in Moshi and shipped direct to London, where it has received reports, from brokers and after examination by the Imperial Institute, that show that



its quality equals and in some cases surpasses that of the non-native coffee from the same region. The aim is for the Association itself to grade and arrange for the shipment of the coffee of its members; and it will not be long before increased experience enables it to undertake this work in its own behalf. Lastly, the native planter like all others will share in the protection to be given by the legislation just mentioned; and the possession by his Association of means of dealing with pests and disease gives him facilities for the purpose that his own small resources could never enable him to acquire.

13. *Potato-growing by Natives.*—The substitution of the deteriorated tubers in the Uluguru Hills above Morogoro by imported strains (from an original importation in 1923 of 2 tons) is now complete and these potatoes are being purchased for the Dar es Salaam market. The similar work in the Kasulo Hills of the Kigoma Province has a far wider area to cover and is still in its initial stages.

14. The recovery of the non-native agricultural industries from war-time injury was described in paragraphs 15 and 16 of the last Annual Report. Good prices for coffee and sisal were maintained and activity in fresh plantings continues. At the end of 1925, ex-enemy estates had been disposed of to the extent of 1,092,470 acres, consisting chiefly of developed and partially developed properties. Of the investment in these 51.35 per cent represents British capital and 29.82 per cent. Indian. In addition to these sales, the Government has disposed of land on long lease to the extent of 33,000 acres.

15. The statistics of export given later (paragraph 69) show that progress in the premier agricultural industry of the Territory, sisal hemp, is being continued. Coffee, on account of an unfavourable season for groundnuts, became third in order of value for export, the shares being non-native 33 per cent., native 67 per cent., the latter coming chiefly from Bukoba where the production is almost entirely native. For increased production of the best grades of coffee the Territory must look to the planters of Kilimanjaro and Meru (Northern Province), whose keenness for progress is worthy of every assistance.

16. The only other mainly non-native production, that of copra, in the hands chiefly of Indians and Arabs, shows an unimportant decrease, whilst its quality continues to be inferior: a matter that is only amendable to control of grading and quality for export, either at the market or at the port, together with the requisite instruction. The non-native production of cotton increased in value to £199,978, but its proportion declined to about 25 per cent. of the whole. Owing to the greatly improved market a sudden rise took place in the production of rubber, by the exploitation of some of the less neglected Ceara plantations for shipment chiefly to Hamburg, from a negligible quantity to 7,520 cwts., worth £49,794, this product taking the place of millet (ninth) in the previous year. For the first eleven agricultural exports (see table, paragraph 69) the values of the non-native and native shares were almost equal (49 and 51 per cent., respectively); but sisal represented more than one-half of the value of these non-native exports: £688,451 in £1,256,332.

17. As far as the work done or projected is concerned, the Agricultural Department, as shown above, is able to assist among non-natives chiefly the coffee planter and the cotton grower. With the increase of its resources, including the provision of a mycologist and an assistant entomologist, already in sight, the Department should be able to approach that degree of assistance that planters rightly desire.

18. *Improvement of the Quality of Cotton.*—Reference has been made already (paragraph 7) to the importation of first-quality cotton seed from Uganda for multiplication for improvement of cotton in Mwanza and Northern Tabora, and to the multiplication of the M cotton, produced by the Cotton Specialist of the Empire Cotton Growing Corporation at the Mpanganya Agricultural Station, Rufiji, for covering that District, this having been selected from his other cottons on the basis of a report on them all by the Fine Cotton Spinners' Association.



19. As regards the samples of commercial cotton receiving report by this Association, of those from all the chief cotton-growing areas the best proved to be from Rufiji and Bagamoyo and the worst from Mwanza, whilst all were inferior to those bred and raised at the Mpanganya Agricultural Station. The examinations by the Imperial Institute have been made for a sufficient number of years for seasonal comparisons to be made, and they continue to show that no deterioration is being suffered by cotton in any of the districts of the Territory. Brokers' reports, mostly made available through the courtesy of ginning firms in the country, continue to demonstrate the superiority of native over non-native cotton, caused chiefly by the circumstance that native cotton is for the greater part carefully sorted into its different qualities, whereas plantation cotton rarely receives this attention.

20. *Agricultural Advice from Headquarters.*—The regular monthly contributions to the vernacular periodical *Mambo Leo* published by Government for natives were continued, and thirty-four articles on agricultural and entomological subjects, as well as regular reports on the condition of crops in the different parts of the Territory, were published in the *Tanganyika Times*. This was in addition to the issue of the two Departmental Leaflets already mentioned (paragraph 4).

21. A large proportion of the correspondence at Headquarters is concerned with the giving of agricultural advice to enquirers and in connexion with matters that arise in the course of the agricultural work in the different districts; and for the simplification and extension of this activity the want of a separate agricultural journal produced in the Territory is felt.

22. *Experiments.*—This form of work for improvement of crop production continued to be carried out at the Agricultural Stations at Morogoro (in the Central Area) and Mpanganya (in the Rufiji District): that for 1925 is recorded in the section of the Report beginning with paragraph 37. A new station for intensive experimentation for dry conditions was opened near Singida, in the Turu country of Dodoma, and the work begun there as far as the lateness in the season permitted is also described in the section mentioned. Lack of staff has so far prevented work from being undertaken for the stations projected for the north-western plateau and the southern coast area, as well as for the minor station for the hill conditions of Kasulo, Kigoma.

## MARKETING IMPROVEMENT AND EXTENSION.

23. So far as the Departmental activities are concerned, these are still almost entirely confined to the cotton crop. The change foreshadowed in paragraph 23 of last year's report was brought into effect in the three leading areas of production: Mwanza Province, Morogoro with Kilosa district and the Lindi area. In the remaining areas and at a few of the more remote centres in the Mwanza and Lindi Provinces, the auction market system was continued, this being almost entirely the simplified system of daily deliveries subsequent to periodical auctions held at the district headquarters. As in past years, a summary of the marketing statistics is given for each area. The figures of value, representing actual cash received by the natives, are of interest as showing to what extent cotton contributes to their prosperity and purchasing power in these districts. It is to be understood that in all these districts buying took place at licensed ginneries in addition to markets or auction markets.

24. The following table affords a comparison of the sales during the season in the different areas (weights are in kilograms of unginned cotton):—

Area	1st quality	2nd quality	3rd quality	Total	Value
Morogoro and Kilosa. ... ..	1,059,871	230,272	554,051	1,844,194	Shs. 962,745
Lindi... ..	600,010	137,108	160,596	897,714	393,329
Kilwa... ..	82,730	56,610	51,096	190,436	89,469
Western Rufiji ... ..	70,191	26,340	99,989	196,520	51,887
Eastern Rufiji ... ..	48,169	38,064	57,335	143,568	55,170
Total for Rufiji ... ..	118,360	64,404	157,324	340,088	107,057



Area	1st quality	2nd quality	3rd quality	Total	Value
					Shs.
Dar es Salaam ... ..	49,351	42,729	27,904	119,984	56,692
Bagamoyo ... ..	80,547	62,522	37,937	181,006	59,968
Pangani and Handeni ... ..	204,115	73,844	22,097	300,056	136,204
Tabora Province ... ..	468,001	83,665	3,160	554,826	249,879
Mwanza Province... ..	4,295,884	744,445		5,040,329	2,153,282
Moshi... ..	23,100	14,218	5,648	42,966	18,680

25. *Morogoro and Kilosa Districts.*—The sales were effected entirely under the new cotton market system, at appointed centres, no auction being held. The adjoining districts of Bagamoyo and Mahenge contributed to the sales, but the figures for these are not included under this area. It will be seen that the natives of these districts alone derived an income approaching £50,000 for the crop of 1925. The following figures indicate the progress in the area since 1922 :—

	1922	1923	1924
Weight in tons of unginned cotton ... ..	149	645	2,165
Value in £ ... ..	3,170	22,918	63,797

The decrease in 1925 took the place of a further anticipated increase and was due to an unusually dry growing season.

26. *Lindi.*—This area includes the districts formerly within the Lindi district: Lindi, Mikindani, Masasi and Tunduru. In all except Tunduru the sales were under the new cotton market system. The Tunduru auction sales contributed 11,000 kgs. of a value of Shs. 4,100. The total for the area in 1924 was 598,464 kgs., thus showing a substantial increase in 1925.

27. *Kilwa.*—In this district the auction markets were continued. Three centres for deliveries were appointed, at Kilwa, Kikanda and Kiswere. The 1924 total was 134,383 kgs., of a value of Shs. 66,345.

28. *Rufiji.*—Auction markets were held at Mohoro, in Eastern Rufiji, only. Elsewhere in this district, deliveries were at ginneries. The figures for 1923 and 1924 are given below, for comparison :—

	1923	1924
	Kgs.	Kgs.
Western Rufiji ... ..	303,586	396,167
Eastern ... ..	46,241	110,353
Total ... ..	349,827	506,520

The considerable drop in Western Rufiji in 1925 was due to the very low rainfall which characterised the season over so great a part of the Territory.

29. *Dar es Salaam.*—Auction markets were held for deliveries at Ruvu and Kisiju. This district shows a decline from the 1924 production of 131,204 kgs., owing to the bad season.

30. *Bagamoyo.*—The crop in this district was mainly purchased at the ginnery at Bagamoyo and the markets in the Morogoro district. One auction market centre was appointed, at Sadani. The 1925 total compares unfavourably with that for 1924 (417,222 kgs.); in this district the drought was particularly severe. The 1923 total was 85,121 kgs.

31. *Pangani and Handeni.*—Auction markets were held at Pangani, and deliveries of cotton from this district were also made at the Sadani auction market. In the Handeni district, the cotton totalled 57,872 kgs. and was bought by the Kwashemshi ginnery. In 1924, the total for the area was 143,650 kgs., realising Shs. 82,246.

32. *Tabora Province.*—No cotton was grown in the Kahama and Nzega districts owing to quarantine measures; the production was confined to the Shinyanga district. In 1924 the Shinyanga district produced 203,419 kgs. and the remainder of the Province 34,805 kgs.



33. *Mwanza Province*.—Auction markets were held at one centre only, Musoma. Elsewhere, buying took place at Cotton Markets and ginneries. In accordance with an old established custom, the cotton was bought in two qualities only. Of the total, the auction market at Musoma accounted for 87,664 kgs. The total in 1924 for the Province was 2,592,899 kgs.

34. *Moshi*.—The cotton in this district was sold by auction. The 1924 total was 98,771 kgs., the decline in 1925 being due again to the unusually severe drought.

35. The table below serves to show the range of prices at the leading sales centres during the year. The prices are in cents of a shilling per kilogram. By 1st quality is meant clean white cotton; by 2nd quality, lightly stained or slightly dirty cotton; by 3rd quality, all other merchantable cotton.

Centre	1st quality		2nd quality		3rd quality	
	Max	Min	Max	Min	Max	Min
Morogoro ... ..	60	50	50	40	30	25
Ngerengere ... ..	54	40	44	25	34	18
Kilosa ... ..	56	50	46	40	29	20
Dar es Salaam ... ..	52	42	37	28	20	20
Bagamoyo ... ..	52	40	37	25	25	20
Mohoro ... ..	61	34	51	24	30	17
Kikale ... ..	42	40	30	28	20	20
Kilimani ... ..	40	32	28	20	20	18
Lindi ... ..	75	45	55	30	37	20
Mikindani ... ..	60	45	50	30	30	20
Masasi ... ..	56	40	50	30	30	20
Kilwa ... ..	66	50	56	40	33	25
Mwanza ... ..	59	52	—	—	31	23
Usagore (Shinyinga) ... ..	53	33	—	—	33	22
Pangani ... ..	61	40	51	30	30	20
Moshi ... ..	63	40	53	30	30	20

36. *Auction Sales of other Produce*.—The Department had no administrative connexion with these sales, which were organised and controlled in each case by the officer administering the district. In the Dodoma, Bagamoyo and Morogoro districts the sales in 1925 were as follows: Dodoma, 1,096 tons of groundnuts; Bagamoyo, 745 tons of copra and 29 tons of gum copal; Morogoro, 147 tons of rice, 83 tons of maize meal, 28 tons of simsim, 60 tons of potatoes and 14 tons of miscellaneous produce.

#### WORK IN STATIONS, GARDENS AND PLOTS.

37. The paragraphs which follow contain a brief account of the more important experiments conducted at the Department's various stations. The unusual character of the rainfall in the 1925 season has affected the purpose of many of the experiments in which results corroborative of these in previous years were looked for. The season of the heavy rains was an entire change from that usual, for it closed in February, the month in which normally it opens.

#### MOROGORO AGRICULTURAL STATION.

38. An abnormally adverse season was experienced at this station, in common with the whole of the central districts from the coast to the lake. Many of the plots throughout the experiments failed to mature the crop. It has been decided, therefore, to record the results only of those trials in which comparative data are available.

39. *Cotton Variety Trials*.—The results of five varieties out of ten are given:—

Variety	Yield per acre in lb. of seed-cotton
Acala .....	256
Early King .....	546
Uganda .....	640
Bancroft Seedling .....	720
Over-the-top .....	820



40. *Cotton : Time of Sowing Experiment.*—Sowings were made at fortnightly intervals from the 8th February to the 22nd March as in the previous year. The results (average of two plots) are shown in the following table, in which those for 1924 are included for the purpose of comparison in relation to the difference in the seasons :—

Owing to the nature of the season, these varieties matured at the same time; which is not the case in normal seasons. All plots suffered from boll-rot.

Date of planting	Rainfall during month in mm.			Comparative yield	
		1924	1925	1924	1925
8/2 ... ..	February	261	118	100	100
22/2 ... ..	March	153	43	82	85
7/3 ... ..	April	207	61	26	62
22/3 ... ..	May	77	41	9	Failure

It may be said that the January rainfall in 1925 was a heavy one (217 mm.) and this helped the early February planting. In 1924 the heavy rainy season began in February; in 1925 it ended in February, a condition, which, so far as is known, is unprecedented in the Territory. The results have at least one value for the Department, favouring, as they do, the principle of early planting under most seasonal conditions.

41. *Cotton : Distance of Sowing Experiment.*—All plots were sown on the 14th February, in rows three feet apart, the distances between the rows varying from 9 inches by increases of 3 inches to 18 inches. The results did not agree with those of the three previous years, in which the yield declined with the wider spacings. In this year the widest spacing (18-inch) gave the highest yield and the narrowest (9-inch) the lowest; the 12-inch, however, was superior to the 15-inch. The dryness of the season no doubt accounts for this partial reversal of the results of the previous years of more favourable rainfall. The lack of corroboration necessitates the continuation of this important experiment.

42. *Cotton : Topping Experiment.*—This experiment was carried out on two types of soil; on neither was any advantage shown by topping.

43. *Sorghum Variety Trials.*—43 varieties were under trial, including several native types. The object of the test is to replace the slow-maturing, tall-growing native type with an improved early type of shorter growth. None of the native types compared favourably with the imported varieties in point of maturity but proved as yet superior in respect of yield. The imported varieties are shown in the table below in their order of maturity, the order of yield of each appearing opposite it in the second column.

Order of Maturity	Order of Yield
Dwarf Hegari .....	IV
Standard White Milo .....	I
Dwarf Yellow Milo .....	II
Feterita .....	VIII
Standard Yellow Milo .....	III
Dwarf White .....	IX
Blackhull .....	X
Pink .....	V
Red .....	VII
Darsa .....	VI

44. The remainder of the experiments at the station were rendered valueless, for purposes of record, by the prolonged drought already referred to.

#### MPANGANYA AGRICULTURAL STATION.

45. The District Agricultural Officer (Mr. A. J. Wakefield) reports as follows :—

Doubt has often been expressed whether the situation and soil of the Station are suited to serve the major cotton growing areas of the District,



and that the lack of uniformity in the soil gives unreliable results of experimentation. The first supposition must have been made without true knowledge of District conditions; the chief cotton-growing areas lie along the river banks where two totally different types of soil are found, one a light sandy soil, occurring wherever the river is bounded by the old sand formation on the one bank and by riverine flats on the other, which accounts for the patchiness of such soils. The second type is purely alluvial and extremely uniform. It is to be found wherever the river is bounded on both banks by riverine flats, usually far removed from the old sand formations, and hence such soils have not suffered the incomplete admixture of coarse sand, which occurs in soils of the first type. The latter (the first type) not only embodies the soil of that part of the Experimental Station under cultivation up to 1925, but at least one third of the district area under cotton. The area of experimentation in the past, including that under the German régime, has been restricted to the first type of soil, the possibilities of the greater part of the Station having been ignored. These were fully examined in 1925, and an area, typical of the second type of district soil mentioned above, has been laid out into three five-acre blocks for experimentation in 1926. The results of the work carried out in 1925 are given below.

46. *Cotton: Time of Sowing Experiment.*—Duplicate plots, each 1/40th acre in area, were sown at fortnightly intervals beginning with February 3. The following results were obtained :—

Date of planting	Rainfall during month, mm.	Comparative yield	No. of days to first picking	Total number of matured bolls per plant.
Feb. 3 ...	February 144.5	90.7	120	52
do. 17 ...	March 58.8	89.4	118	48
Mar. 3 ...	April 122.2	100.0	104	54
do. 17 ...	May 49.7	59.3	125	24
do. 31 ...	June 5.5	56.2	132	18
Apr. 14 ...	July 1.4	48.1	139	17
do. 28 ...	August 8.0	32.7	146	12
	September 8.7			

The results over four years are given in the following table :—

Year	Date of best Planting
1922 ... ..	March 5
1923 ... ..	March 1
1924 .. ...	March 24
1925 ... ..	March 3

It should be noted that in the years 1922 to 1924 the first-sown plots gave the highest yields, but there were no previously sown plots, an omission which has been corrected from 1925 onwards. Records of maturity in the 1925 experiment show that from March 3 (the optimum time of sowing) onwards, the number of days from sowing to first picking increases, thus still further delaying the maturity of the crop, with a resultant loss of vigour in such maturation and a loss of the normal heavy first picking of the early sowings. The records of boll-shedding indicate that this is affected by the daily rainfall, but it is most affected (in increasing ratio) by the extent of vegetative growth. Thus the number of bolls shed per plant with the earlier sown plots is far greater than with later sowings, but the percentage of boll shedding is less, the actual number of bolls which mature being approximately 60 per cent. with the early sown plots over those sown from the middle of the rains to their cessation. This is due to the decreased boll formation in the latter.

47. *Cotton: Distance of Sowing Experiment.*—A comprehensive series of spacings was included in duplicate plots sown on March 3, and repeated again in duplicate plots on April 12. The results are given in the following table (1924 results are included) :—



Spacing	Comparative Yields	
	1925	1924
2½ ft. x 9" ... ..	65.7	
2½ " x 12" ... ..	55.5	81
2½ " x 15" ... ..	65.8	
2½ " x 18" ... ..	76.5	86
3 " x 9" ... ..	No result	
3 " x 12" ... ..	No result	96
3 " x 15" ... ..	59.2	
3 " x 18" ... ..	100.0	100
3 " x 24" ... ..	78.1	86
3 " x 30" ... ..	88.5	
4 " x 12" ... ..	No result	
4 " x 18" ... ..	71.5	
4 " x 24" ... ..	60.2	
4 " x 36" ... ..	68.2	

48. The absence of result in the three plots noted above was due to destruction of the seedlings in these plots by millipedes.

49. *Cotton: Improvement in Quality.*—Of the material taken over from the Cotton Specialist, selections Mp 4/2, Mp 9, Mp 8/1, Mp 19, Mp 18, Mp 13/3 and Mp 9/2 were retained on advice after examination, received from The Empire Cotton Growing Corporation; the remainder were discarded. Three of the above selections were sown in duplicate half acre plots, the following results being obtained :—

Selection	Yield per acre
Mp 4/2 ... ..	404 lb. of seed-cotton
Mp 9 ... ..	616 " " "
Mp 12 ... ..	655 " " "

The control plot of ordinary district cotton gave 556 lb. of seed-cotton per acre. The plot of Mp 4/2 suffered a loss of 40 per cent. from attack by rats.

50. The remaining selections were sown in single rows, the flowers being stitched to prevent hybridisation. The following yields of seed-cotton were obtained :—

Selection	Yield per plant
Mp 8/1 ... ..	0.17 lb. seed-cotton
Mp 19 ... ..	0.21 " "
Mp 18 ... ..	0.28 " "
Mp 13/3 ... ..	0.33 " "
Mp 9/2 ... ..	0.36 " "

The control plot of ordinary district cotton gave 0.27 lb. seed-cotton per plant. Selection Mp 9 was of rank growth with long sweeping laterals. Mp 4/2, while being of normal lateral growth, was extremely tall. Mp 12 showed a desirable sturdy and even growth, and the remaining selections were all of a similar bushy growth.

51. The remaining seed of selection Mp 12 was grown at Logeloge Estate by Messrs. Frantzis and Horn for extensive multiplication, under the supervision of the District Agricultural Officer. The total area sown was 57 acres, which yielded a total of 44,860 lb. of seed-cotton, (790 lb. per acre). Further multiplication of seed is taking place in 1926. The intended substitution of the ordinary district seed by this selection will take place in 1927, should the favourable reports of its qualities receive confirmation this year (1926).

52. *Groundnuts.*—These were grown for multiplication of existing stocks for ultimate distribution to natives. Yields of 1,995 lb., of unshelled nuts per acre were obtained, giving 1,144 lb., of shelled nuts, or 57 per cent.

#### SINGIDA AGRICULTURAL STATION.

53. In spite of the circumstance that this Station was opened late in the season, trials of certain crops were begun, in order to make the best use of the part of the planting season still available; and the following results



are sufficiently significant to be given here for record and future comparison, in spite of the handicap through late sowing suffered by the plants affording them.

54. *Pigeon Pea*.—This is under trial as a combined wind-break and food-plant likely to appeal to natives, temporary wind-breaks for protecting annual crops being of particular importance in this windy area both for the protection of plants and the conservation of soil. The late planting gave ill-grown plants, which nevertheless yielded grain and bore well the dry weather characteristic of the district.

55. *Groundnuts*.—Late planting and large losses through porcupine prevented any significant results from being obtained.

56. *Bush Lima Beans*.—A leguminous food crop useful in rotation (grown with other varieties of *Phaseolus lunatus* fairly largely in the Territory under the name "maharagwe"). The results show that it is worth trial.

57. *Cowpea*.—This is the native "kunde," common in many parts of the Territory; but little used in the area of trial. It showed greater success than all the other crops under experiment; and native farmers have already been usefully impressed by the demonstrations to show its value to them, and are asking for seed.

58. *Tepary Bean*.—Poor germination showed that this drought-resistant bean (*Phaseolus acutifolius*, a native of Arizona and Mexico introduced by this Department from South Africa, and likely to become of the greatest importance in native economics) must be planted early in order that it may be useful for its particular purpose.

59. *Rice*.—The trials were with an indigenous rice of outstanding value in the Territory, "faya" (or "afiya"?); and indicated that experiments, with early planting in suitable areas, will be worth while.

60. *Millet*s.—The introduction of early varieties will be of great consequence to the district; but it is evident that timely planting will be a necessary factor for success with these.

61. *Maize*.—This is doubtfully useful in the very dry conditions; but work will continue, with early varieties alone.

#### BOTANIC GARDENS, DAR ES SALAAM.

62 Plant and seed introductions and distributions from the Gardens are shown in the following table:—

Introduction		Distribution	
Plants	Seeds (packets)	Plants	Seeds (packets)
42	95	990	61

The above figures do not include cuttings or other planting material, of which four bundles of cuttings were received, and three hundred and sixty-two offsets were distributed. The systematic plantings in the Gardens of both indigenous and exotic species have continued.

63. The avenue trees in the Township have received constant attention, and a feature of this work is the raising in the Gardens nursery of a considerable number of seedlings for planting as avenue trees in the new native quarter of the town. The duties of plant import inspector at Dar es Salaam were carried out by the Head Gardener. Fifty-four consignments of plants and seventy-two of seeds were examined. Of these, the following were destroyed or refused entry under the powers of the Plant Pest and Disease (Import) Regulations:—

- 1 parcel of citrus plants.
- 12 parcels of coffee seeds.
- 1 parcel of cotton seeds.
- 3 consignments of various plants.
- 12 bags of pineapple suckers.



64. Other duties carried out by the Head Gardener during the year were the maintenance of Government House Grounds and the inspection of plantations in and near the town. The cotton auction markets in Dar es Salaam were also conducted by the Head Gardener.

65. *Investigations with Plants.*—Trials were made with the indigenous fodder grass of farmed areas, *Panicum trichocladum*, with the cosmopolitan dub grass, *Cynodon Dactylon*, with the shade-loving grass, *Stenotaphrum complanatum*, introduced by the Department from Mauritius, and with the alleged tsetse-repellent efwatakala grass (*Melinis minutiflora*). The first, among grasses best liked by stock and most commonly collected by herdsmen, requires in the dry season light shade or the wet conditions of banks of streams, when grown near the coast. Dub grass is easy to establish, and observations showed that, even in the light, dry soils of the coast, if these are treated with lime, it will grow luxuriantly as a pasture grass well on into the dry season. The third is growing under the shade of rain trees, and further observations for deciding its usefulness are being made. The work with efwatakala grass showed that it repels such insects as grasshoppers and crickets; but no information was obtained as to its effect on mosquitoes as these failed to develop in the collections of water provided for them, and plantings made near the Gerezani mosquito-producing streams, in consultation with the Medical Officer of Health, were eagerly and thoroughly grazed by cattle.

66. Four cover crops were grown, for trial for possible use in planting near the coast; these were: the very similar *Tephrosia hookeriana* and *T. purpurea* (previously sown for increase), *Sesbania aegyptiaca* and *Centrosema pubescens* (much written of in the East). The first two made fair growth as perennial plants reaching a height of about four feet; whilst the others showed that they were not suited to the conditions. All were inferior for the purpose to any of the beans commonly grown in the country.

67. A type of Ambari hemp (*Hibiscus cannabinus*) imported by the late Cotton Specialist from India, after having been planted for increase, was grown for trial with the indigenous kind of the neighbourhood; but proved inferior. An improved ochro from Hawaii was tried; but was attacked to such a degree by the spiny and pink bollworms of cotton that it was destroyed. Pastmantier's Mauritius pawpaw was introduced from South Africa, where it is highly esteemed; but has not given the high percentage of fruiting trees claimed for it.

#### CROP YIELDS.

68. The table below shows the yields per acre in 1925 of various crops from measured plots in native fields. The crops on many of the plots selected for this purpose were partially destroyed, by game or vermin, and these have been omitted. No special treatment was accorded to any of these plots.

District and locality				Number of plots measured	Yield per acre, lb.
COTTON (unginned)					
Rufiji					
Mpanganya	...	...	...	2	490
Tetema	...	...	...	2	872
Mohoro	...	...	...	3	278
Various	...	...	...	7	369
Moshi					
Upare West	...	...	...	6	629
Upare East	...	...	...	1	434
Upare Central	...	...	...	1	873
Lindi					
Mtua	...	...	...	2	325
Nahinu	...	...	...	3	534
Mikindani	...	...	...	1	626
Various	...	...	...	5	521
Kilwa					
Kikanda	...	...	...	1	334
Samanga	...	...	...	1	191



District and locality	Number of plots measured	Yield per acre, lb.
<b>COTTON (unginned) <i>Contd.</i></b>		
Mwanza		
Urina ... ..	1	290
Sengerema... ..	1	325
Nasa ... ..	1	352
Buchosa ... ..	1	289
Kome Island ... ..	1	408
Ukerewe Island ... ..	2	425
Nunghu ... ..	1	364
Nera ... ..	1	313
Kilima ... ..	1	430
Usmau ... ..	1	296
Shinyanga		
Various ... ..	6	226
<b>MAIZE</b>		
Rufiji		
Mtanza East ... ..	2	1,691
" Central ... ..	1	1,199
" West ... ..	9	1,176
Mpanganya ... ..	1	2,211
Utete West ... ..	1	2,640
<b>GROUNDNUTS (shelled)</b>		
Rufiji		
Mpanganya ... ..	1	1,140
Mohoro ... ..	1	836
Mwanza		
Nera ... ..	1	324
Mwanimiri ... ..	1	542
Usmau ... ..	2	596
Ukerewe Island ... ..	2	580
<b>RICE (husked)</b>		
Rufiji		
Various ... ..	9	1,313
<b>CANE-SUGAR (brown native)</b>		
Rufiji		
Ndundu ... ..	1	706
<b>SORGHUM (Kaffir corn)</b>		
Rufiji		
Various ... ..	9	1,041

#### PROGRESS OF THE CHIEF EXPORT CROPS.

68. The table referred to in paragraph 6 dealing with Crop Improvement and Extension is now given as an introduction to this section and no further explanation is required in respect of its indications of progress. The present section is intended to deal with the progress of these crops in the different districts.



# TANGANYIKA TERRITORY. PRINCIPAL EXPORTS, 1923 AND 1922-5.

1923.

1922.

EXPORT.	1923.				1922.				Value on par of 1913. £.
	Quantity. Cwts.	Value. £.	% of Total Value.	Order.	Quantity. Cwts.	Value. £.	% of Total value.	Order.	
Sisal	416,680	535,580	30.1	I.	204,480	289,388	22.3	I.	262,829
Hides and Skins	69,120	274,511	15.4	III.	30,495	67,156	5.2	VI.	121,111
Cotton	43,840	120,753	6.7	IV.	30,887	140,750	10.8	IV.	85,075
Copra	109,540	117,401	6.6	V.	95,420	89,633	6.9	V.	102,268
Groundnuts	179,220	95,932	5.3	VI.	250,360	190,553	14.7	III.	134,012
Beeswax	11,180	70,743	4.0	VII.	6,655	24,792	1.9	X.	42,110
Coffee	21,180	46,563	2.6	VIII.	85,426	203,784	15.7	II.	187,804
Simsim	29,520	20,407	1.1	XI.	55,560	49,573	3.8	VIII.	38,408
Rice	15,420	8,717	0.5	—	30,523	26,417	2.0	IX.	17,255
Millet	18,210	5,498	0.3	—	200,517	61,898	4.7	VI.	60,540
Totals	913,910	1,296,105	72.6	—	990,323	1,143,944	88.0	—	1,051,412
Plantation Rubber	25,740	309,195	17.4	II.	186	381	—	—	—
Ghee	6,656	15,400	0.8	X.	—	—	—	—	—
Cotton Seed	—	—	—	—	—	—	—	—	—

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1923.

1924.

1925.

EXPORT.	1923.				1924.				1925.			
	Quantity. Cwts.	Value. £.	% of Total value.	Order.	Quantity. Cwts.	Value. £.	% of Total value.	Order.	Quantity. Cwts.	Value. £.	% of Total value.	Order.
Sisal	256,900	367,228	22.2	I.	368,560	644,835	24.7	I.	365,520	688,451	22.9	I.
Hides and Skins	41,370	117,554	7.1	VI.	50,948	185,843	7.1	V.	53,225	240,165	8.0	IV.
Cotton	29,386	177,710	10.7	IV.	50,828	373,753	14.3	II.	90,043	540,481	18.0	II.
Copra	133,380	131,536	7.9	V.	162,500	178,194	6.8	VI.	152,460	160,800	5.3	VI.
Groundnuts	330,160	261,129	15.9	II.	373,680	359,918	13.8	III.	181,100	178,685	5.9	V.
Beeswax	6,039	24,758	1.5	X.	8,497	44,666	1.7	X.	5,858	42,755	1.4	X.
Coffee	80,937	264,987	12.4	III.	105,222	352,529	13.5	IV.	120,186	481,055	16.0	III.
Simsim	88,700	75,527	4.6	VII.	78,180	80,324	3.1	VII.	67,920	71,561	2.4	VII.
Rice	57,721	41,517	2.5	VIII.	62,235	59,866	2.3	VIII.	60,921	62,232	2.1	VIII.
Millet	121,973	36,095	2.2	IX.	158,332	49,976	1.9	IX.	66,531	25,517	0.8	—
Total	1,145,566	1,441,041	87.0	—	1,418,982	2,329,904	89.2	—	1,104,753	2,515,979	83.6	—
Plantation rubber	—	—	—	—	—	—	—	—	7,520	49,794	1.6	IX.
Ghee	—	—	—	—	—	—	—	—	7,658	33,770	1.1	—
Cotton seed	—	—	—	—	—	—	—	—	86,980	32,560	1.1	—



## COTTON.

70. The table which follows is a statement of production of lint from the crops of the 1922 season onwards. The figures represent the actual output of the areas as shewn in the returns from ginneries. A list of ginneries is given in Appendix III.

## COTTON LINT PRODUCTION (BY AREAS).

Area	In lb.				Difference per cen	
	1922	1923	1924	1925	1924	1925
Morogoro and Kilosa	832,970	1,717,301	2,972,142	2,441,026	+ 73	— 17
Mwanza ... ..	1,160,685*	1,807,337 <sup>†</sup>	2,128,694	3,510,689	+ 18	+ 65
Tabora... ..	— †	—	175,894	365,022	—	+107
Lindi ... ..	218,032	261,546	442,098	666,501	+ 69	+ 50
Kilwa ... ..	39,796	124,905	111,130	188,677	+ 11	+ 69
Rufiji ... ..	269,493	264,814	362,484	288,826	+ 37	— 20
Dar es Salaam ...	152,080	104,899	251,681	195,433	+140	— 25
Bagamoyo ... ..	77,504	73,373	289,496	128,886	+295	— 66
Pangani ... ..	4,950	1,716	95,025	276,388	(High)	+190
Tanga, Usambara and Moshi ... ..	99,192	—	—	—	—	—
Tanga and Usambara	—	154,330	—	—	—	—
Moshi ... ..	—	46,415	407,527	160,470	(High)	— 61
Tanga ... ..	—	—	78,291	244,904	—	+189
Usambara ... ..	—	—	153,156	82,058	—	— 47
Mahenge ... ..	15,334	17,068	6,483	10,782	—62	+ 60
Bukoba ... ..	—	—	40,429	8,546	—	— 79
Arusha ... ..	—	—	2,234	107,344	—	(High)
Rungwe ... ..	—	—	600	14,128	—	(High)
Totals... ..	2,870,036	4,573,704	7,517,364	8,669,680	+ 64	+ 15

\*Includes Tabora.

†Included in Mwanza.

71. The succeeding table is a detailed statement of the progress of native cotton production throughout the Territory, by areas.



PRODUCTION OF COTTON BY NATIVES, IN LB.

Area	1922	1923	1924	1925	Difference, per cent	Percentage of total district production		Percentage of total native production	
						1924	1925	1924	1925
Morogoro and Kilosa	98,666	448,965	1,472,021	1,228,796	- 17	50	50.3	31.2	19.05
Mwanza*	714,366	1,753,117	1,711,292	1,410,659	+100	—	91	—	52.8
Tabora	—	—	159,930	349,622	+120	81	96	39.7	5.4
Lindi	54,432	248,469	404,109	610,581	+ 50	91	91.6	8.6	9.5
Kilwa	39,796	124,905	88,693	126,957	+ 43	80	68	1.9	1.9
Rufiji	245,042	238,579	335,061	260,884	- 22	92	90	7.1	4.06
Dar es Salaam	379	29,601	86,904	79,990	- 10	35	41	1.8	1.2
Bagamoyo...	56,858	50,319	265,485	120,637	- 55	92	90	5.6	1.9
Pangani	4,950	7,725	95,025	203,038	+113	100	74.6	2.0	3.1
Moshi	7,421	3,500	65,670	25,364	- 61	16	15.7	1.4	0.4
Bukoba	—	—	14,468	7,880	- 46	36	92	0.3	0.12
Mahenge	6,681	7,725	4,980	10,782	+117	—	—	0.1	0.25
Tanga and Usambara	508	3,500	7,938	1,876	- 77	3	0.6	0.2	0.02
Arusha	—	—	2,234	5,886	+163	100	6	0.05	0.1
Rungwe	—	—	600	14,128	(high)	100	100	0.01	0.2
Total ...	1,229,099	2,940,710	4,714,410	6,457,080	37	—	—	—	—

Percentage of total production of the Territory: 1923, 64.3, 1924, 62.7, 1925, 74.3

\*Tabora included for 1922, 1923.

## SISAL.

72. Of 18,276 tons of sisal hemp and tow exported in 1925, 12,355 tons (62 per cent.) was produced in the north-eastern districts serving the Tanga Railway (almost entirely from the Tanga and Usambara districts). The exports of 1924 from these districts amounted to 12,477 tons; thus a slight decrease is shown. Exports from the Lindi districts totalled 1,930 tons; from Dar es Salaam (for Dar es Salaam and Morogoro districts) 3,662 tons, an increase of 50 per cent. over 1924 and 112 per cent. over 1923. Districts of lesser production are Moshi and Mwanza.

## COFFEE.

73. A further increase in production in the north-eastern coffee area, comprising the districts of Arusha, Moshi and Usambara, is to be recorded: from 31,580 cwts. exported in 1924, to 37,136 cwts. in 1925. Of the latter figure, 1,900 cwts. were produced by natives. The production of the mostly native-grown coffee in Bukoba district increased from 51,251 cwts. in 1923 to 73,620 cwts. in 1924 and 83,023 cwts. in 1925.

## GROUNDNUTS.

74. The figures for the three leading areas of production are as follows:—

	1923.	1924.	1925.
	Tons.	Tons.	Tons.
Mwanza (including Shinyanga) ... ..	7,778	6,494	4,092
Dodoma (including Kondoa Irangi) ... ..	1,927	2,695	1,094
Tabora (excluding Shinyanga) ... ..	4,529	8,049	2,632

Mwanza recorded a large increase in plantings but suffered seriously from a bad rainy season, as was the case also in Tabora and Dodoma.

## COPRA.

75. All coastal districts produce copra. Of the leading districts, Tanga increased its production from 1,548 tons in 1923 to 2,647 in 1924 and 2,680 in 1925; Mafia Island 1,460 to 1,690 tons (1924) but 1,569 tons in 1925; Dar es Salaam from 1,277 to 1,340 tons in 1924, but 1,127 tons in 1925; Bagamoyo showed a decrease, from 1,161 to 1,058 tons between 1923 and 1924, but an increase to 1,232 tons in 1925.

## SIMSIM (SESAME).

76. Lindi district leads the production with 1,870 tons, an increase of 119 tons over 1924. Other districts of importance are Mwanza, Kilwa and Morogoro, of which in 1924 and 1925 Mwanza (with Musoma) exported 720 and 486 tons respectively and Kilwa 446 and 333 tons.

## GRAIN

77. This class of exports includes millets, maize, rice and pulses. The export of these does not depend so much upon local surpluses as upon seasonal conditions in other parts of the East. The chief producing area for export (mainly of sorghum millet) is the Lindi Province, which in 1924 contributed 51 per cent., of the total exports (14,483 tons) and in 1925 48 per cent., of a total export of 7,392 tons. All districts except those too remote from the railways or coast contribute from their food surpluses towards export, the more important (other than Lindi) being Morogoro, Kilwa, Rufiji and Mwanza.

## BEESWAX.

78. The production for export is confined almost entirely to the Central Railway districts of Morogoro, Dodoma and Tabora, which produced 5,084 cwts. of a total of 5,858 cwts. exported in 1925, a decrease of 34 per cent. (7,775 cwts. in 1924) but approximately the 1923 figure (5,198 cwts.). Lesser exporting districts are Mwanza and Lindi. Lindi showed an increased export from 220 cwts. in 1924 to 445 cwts. in 1925; Mwanza a reduction from 373 cwts. to 229 cwts.



## CHILLIES.

79. From a total export of 18,198 cwts. in 1924, of which Bukoba Province exported 17,096 cwts., or 94 per cent., the export in 1925 dropped to 2,474 cwts. of which Bukoba produced 2,188 cwts.

## GUMS.

80. The decrease in export of gum arabic from 11,378 cwts. in 1923 to 5,238 in 1924 (54 per cent.) has been almost completely recovered in 1925 (10,241 cwts.); the export of gum copal remains stationary at 3,188 cwts. (3,133 in 1924). The former is produced almost entirely in the Tabora and Mwanza districts; the latter chiefly in the Bagamoyo district.

## RUBBER.

81. The export of plantation rubber (Ceara) increased, with the improved prices, from 1,000 cwts. in 1924 to 7,520 cwts. in 1925; that for wild rubber from 583 cwts. to 1,187 cwts.

## RAW SUGAR.

82. The export of 35 tons in 1924 remains the same in 1925, Pangani district being the source of over 80 per cent. Minor districts of production are Morogoro, Dar es Salaam, Lindi, Rufiji, Mwanza, Moshi.

## CONTROL OF PLANT PESTS AND DISEASES.

83. *Pink Bollworm of Cotton*.—The temporary quarantine in the Tabora Province (Except Shinyanga) with its prohibition of cotton-growing has been removed except for the area surrounding Tabora township within a radius of ten miles. This removal followed a careful inspection of the region by the Entomologist.

84. *Uprooting and Burning of Cotton*.—The reasons and the beneficial effect of this are now established in the native mind wherever cotton has become a regular and staple crop and little difficulty in these areas is being experienced. The realisation of the value of early planting in itself is being assisted by this circumstance, and it may be said that in the main cotton districts early planting and early uprooting are becoming established features of the cultivation. This is one of the chief aims in the cotton work of the Department, as experience has proved this to be a satisfactory measure of control of insect pests, particularly of the pink bollworm and the cotton weevil.

85. *Exclusion of Pests and Diseases*.—The assistance of the legislation for effecting this has been rigidly sought, with the result that the control that is so particularly important in the early or reviving stages of the planting industry of a country has been exercised. This is of special value to coffee, cotton and fruit growers, whose protection in this respect is at present of paramount importance.

## METEOROLOGICAL MATTERS.

86. At the end of 1925 the number of stations provided with meteorological equipment was eighty-eight. Of these thirty-two had raingauges only. Seventy-two stations furnished regular records. Appendix IV gives the monthly rainfall for these stations in 1925 and additional records for a few of the stations in widely separated parts of the Territory.

## REVENUE.

87. A statement is presented in Appendix VII.

## BIOLOGICAL AND AGRICULTURAL INSTITUTE, AMANI.

88. The Head Gardener, Mr. F. M. Rogers, was absent for six months of the year and the care of the Institute during this period was in the hands of an Under Gardener. An abstract of the Head Gardener's report is given in Appendix V.

A. H. KIRBY,  
Director of Agriculture.

19  
APPENDIX I.

DISTRIBUTION OF PLANTING MATERIAL DURING THE  
YEAR ENDING 31ST MARCH, 1926.

ECONOMIC PLANTS.

Cotton Seed	...	...	...	...	...	...	...	1,368 tons.
Groundnuts	...	...	...	...	...	...	...	3,830 lb
Maize	...	...	...	...	...	...	...	2,085 lb
Beans, Madagascar Butter	...	...	...	...	...	...	...	1,289 lb
„ Lima	...	...	...	...	...	...	...	3,033 lb
„ Soya	...	...	...	...	...	...	...	840 lb
„ Cowpeas	...	...	...	...	...	...	...	180 lb
Rice	...	...	...	...	...	...	...	6,795 lb
Potatoes	...	...	...	...	...	...	...	2,240 lb
Wheat	...	...	...	...	...	...	...	90 lb
Milletts	...	...	...	...	...	...	...	70 lb
Coffee	...	...	...	...	...	...	...	150 lb
Ginger rhizomes	...	...	...	...	...	...	...	1,272 lb
West African Oil Palm	...	...	...	...	...	...	...	7 lb
Onion	...	...	...	...	...	...	...	29 packets of seed.
Cinchona	...	...	...	...	...	...	...	11 do.
Cacao	...	...	...	...	...	...	...	3 do.
Spices	...	...	...	...	...	...	...	10 do.
Clove	...	...	...	...	...	...	...	300 do.
Fruit trees and miscellaneous plants	...	...	...	...	...	...	...	{ 170 do.
								{ 139 plants.

DECORATIVE PLANTS.

Palms	...	...	...	...	...	...	...	{ 29 packets of seed.
								{ 10 plants.
Trees for shade and wind-breaks, ornamental trees, shrubs and plants	...	...	...	...	...	...	...	{ 1,707 do.
								{ 91 packets of seed.
								{ 17 parcels of cuttings.



## APPENDIX II.

## TANGANYIKA TERRITORY.

## DEPARTMENT OF AGRICULTURE.

## SEEDS DISTRIBUTION

Seeds available at the Biological and Agricultural Institute, Amani.

1. Kei apple	<i>Aberia caffra</i>	64.	<i>Brunfelsia americana</i>
2.	" <i>Gardnerii</i>	65.	<i>Caesalpinia coriaria</i>
3. Devil's Cotton	<i>Abroma augusta</i>	66.	Peachwood: lima wood " <i>echinata</i>
4. Catechu	<i>Acacia Catechu</i>	67.	Barbados pride <i>Caesalpinia pulcherrima</i>
5.	" <i>Cunninghamii</i>	68.	<i>Calathea zebrina</i>
6. Wattle bark	" <i>decurrens</i>	69.	<i>Calliopsis atrosanguinea</i>
7. Cassie	" <i>farnesiana</i>	70.	<i>Callitris quadrivalvis</i>
8. Gum arabic	" <i>Senegal</i>	71.	" <i>robusta</i>
9. Palm	<i>Acanthophoenix alba</i>	72.	<i>Caloncola Grotei</i>
10.	<i>Acer oblongum</i>	73.	<i>Calophyllum Inophyllum</i>
11.	<i>Acokanthera spectabilis</i>	74.	China tea <i>Camellia theifera</i>
12. Sapodilla plum	<i>Achras Sapota</i>	75.	Ylang-Ylang <i>Cananga odorata</i>
13.	<i>Adenanthera microsperma</i>	76.	Java almond <i>Canarium commune</i>
14. Barricari seeds	" <i>pavonina</i>	77.	" <i>polyphyllum</i>
15. Mnongo	<i>Afzelia quanzensis</i>	78.	<i>Cannas</i> (mixed vars.)
16.	" <i>bijuga</i>	79.	Pawpaw <i>Carica Papaya</i>
17.	<i>Albizia fastigiata</i>	80.	Panama hat plant <i>Carludovica incisa</i>
18.	" <i>glabrescens</i>	81.	" " " " <i>palmata</i>
19. Lebbek; Siris	" <i>Lebbek</i>	82.	Palm " <i>Carvalhoa petiolata</i>
20.	" <i>moluccana</i>	83.	" <i>Caryota mitis</i>
21.	" <i>procera</i>	84.	Kitul palm " <i>urens</i>
22.	" <i>stipulata</i>	85.	Mexican apple <i>Casimiroa edulis</i>
23.	" <i>versicolor</i>	86.	<i>Cassia bacillaris</i>
24. Candle nut	<i>Aleurites triloba</i>	87.	" <i>siamea</i>
25.	<i>Allamanda nerifolia</i>	88.	Panama rubber <i>Castilloa elastica</i>
26.	<i>Allanblackia Stuhlmannii</i>	89.	<i>Casuarina distyla</i>
27.	<i>Aloe saponaria</i>	90.	Whistling Willie " <i>equisetifolia</i>
28.	" sp.	91.	" <i>suberosa</i>
29. Cherimoyer	<i>Anona Cherimolia</i>	92.	Forest oak " <i>torulosa</i>
30. Soursop	" <i>muricata</i>	93.	Arabian tea <i>Catha edulis</i>
31. Bullock's heart	" <i>reticulata</i>	94.	West Indian cedar <i>Cedrela odorata</i>
32.	<i>Angelonia grandiflora</i>	95.	" sp.
33.	<i>Anthocleista orientalis</i>	96.	Toon tree " <i>Toona</i>
34.	<i>Antiaris usambarensis</i>	97.	<i>Celosia argentea</i>
35.	<i>Antidesma Ghesaembilla</i>	98.	Cock's comb " <i>cristata</i> , var <i>pyramidalis</i>
36.	<i>Antirrhinum majus</i> : vars.	99.	Cornflower <i>Centaurea Cyanus</i>
37.	<i>Araucaria Bidwillii</i>	100.	<i>Chrysanthemum segetum</i>
38.	" <i>brasiliense</i>		var. <i>Evening Star</i>
39. Areca nut palm	<i>Areca Catechu</i>	101.	" " <i>gloria-alba</i>
40. Palm	" <i>triandra</i>	102.	Coco plum <i>Chrysobalanus Icaco</i>
41.	<i>Arenga saccharifera</i>	103.	<i>Chrysophyllum africanum</i>
42.	<i>Argemone mexicana</i>	104.	Star apple " <i>Cainito</i>
43.	<i>Aristolochia elegans</i>	105.	" <i>ferrugineo-tomentosum</i>
44.	<i>Artemisia afra</i>		" <i>msolo</i>
45. Bread fruit	<i>Artocarpus incisa</i>	106.	" <i>Cinchona Ledgeriana</i>
46. Jak fruit	" <i>integrifolia</i>		x <i>C. succirubra</i>
47.	" <i>nobilis</i>	108.	Ledger bark <i>Cinchona Ledgeriana</i>
48. Asparagus	<i>Asparagus officinalis</i>	109.	" <i>robusta</i>
49.	" <i>plumosus</i>	110.	Red bark " <i>succirubra</i>
50.	" <i>Sprengeri</i>	111.	Camphor <i>Cinnamomum Camphora</i>
51. Carambola	<i>Averrhoa Carambola</i>	112.	Cinnamon " <i>zeylanicum</i>
52. Mkuruti	<i>Baphia Kirkii</i>	113.	Sweet orange <i>Citrus Aurantium</i>
53. Mtomondo	<i>Barringtonia racemosa</i>	114.	Seville orange " var. <i>Bigaradia</i>
54.	<i>Bauhinia acuminata</i>		" <i>decumana</i>
55.	<i>Berlinia Scheffleri</i>	115.	Grape fruit " <i>medica</i>
56. Trincomalee wood	<i>Berria Ammonilla</i>	117.	Sweet lime " var. <i>Limetta</i>
57.	<i>Bersama usambarica</i>	118.	Lemon " " <i>Limonium</i>
58. Annatto	<i>Bixa Orellana</i>	119.	" <i>nobilis</i>
59. China grass	<i>Boehmeria nivea</i>	120.	Mandarin orange " var. <i>major</i>
60.	<i>Bombax rhodognaphalon</i>	121.	Wampee <i>Clausena Wampei</i>
61.	<i>Bosquiea carasifolia</i>		
62.	<i>Bridelia micrantha</i>		
63.	<i>Brochoneura usambarensis</i>		

## Seeds available at the Biological and Agricultural Institute, Amani (Contd.).

122.		<i>Clerodendron sinuatum</i>	196.		„ <i>owariensis</i>
123. Palm		<i>Cocos australis</i>	197. Pitanga cherry	„	<i>uniflora</i>
124. „		„ <i>eriospatha</i>	198. Bark-cloth tree	<i>Ficus chlamydodora</i>	
125. „		„ <i>plumosa</i>	of Uganda		
126. Arabian coffee	<i>Coffea arabica</i>		199. Indiarubber fig	<i>Ficus elastica</i>	
127. Bukoba coffee	„	<i>bukobensis</i>	200. Indian fig	„	<i>indica</i>
128.		„ <i>excelsa</i>	201.	„	<i>nitida</i>
129. Liberian coffee	„	<i>liberica</i>	202.	„	<i>Ribes</i>
130.		„ <i>micrantha</i>	203.		<i>Ficus Vallis-choudae</i>
131.		„ <i>Quilloa</i>	204.	„	<i>Volkensii</i>
132.		<i>Coffea robusta</i>	205.		<i>Flacourtia cataphracta</i>
133.		„ <i>stenophylla</i>	206. Governor plum	„	<i>Ramontchi</i>
134. Kola nut		<i>Cola acuminata</i>	207.		<i>Rukam</i>
135.		„ <i>usambarensis</i>	208. Lagos silk rubber	<i>Funtumia elastica</i>	
136.		„ <i>vera</i>	209.		<i>Garcinia ferrea</i>
137.		<i>Cordia Gerascanthus</i>	210.	„	<i>Xanthochymus</i>
138.		<i>Cosmos bipinnatus</i>	211.		<i>Gliricidia maculata</i>
139. Croton oil		<i>Croton Tigilium</i>	212.		<i>Gloriosa simplex</i>
140.		„ <i>megalocarpus</i>	213.		<i>Grevillea Banksii</i>
141.		<i>Cryptomeria japonica</i> , var. <i>araucarioides</i>	214.		„ <i>Hilliana</i>
142.		„ <i>glabra</i>	215. Silky oak	„	<i>robusta</i>
143. Cypress		<i>Cupressus Benthami</i>	216.		<i>Grewia calymmatosepala</i>
144.		„ <i>funebis</i>	217. Logwood	<i>Haematoxylon campechianum</i>	
145.		„ var. <i>glauca</i>	218.		<i>Harongana madagascariensis</i>
146.		„ <i>lusitanica</i>	219. Cherry pie	<i>Heliotropium peruvianum</i>	
147.		„ <i>macrocarpa</i>	220. Lemon lily	<i>Hemerocallis aurantiaca</i>	
148.		„ <i>sempervirens</i>	221. Para rubber	<i>Hevea brasiliensis</i>	
149. Turmeric		<i>Curcuma longa</i>	222. Roselle: sorrel	<i>Hibiscus Sabdariffa</i>	
150.		<i>Cynometra cauliflora</i>	223.	„	<i>Scottii</i>
151. Tree tomato		<i>Cyphomandra betacea</i>	224.	„	<i>syriacus</i>
152.		<i>Dahlias</i> (Cactus mixed)	225.		<i>Hippeastrum equestre</i>
153.		„ (Single „ )	226. Coral tree	<i>Hovenia dulcis</i>	
154.		<i>Datura arborea</i>	227. Sandbox tree	<i>Hura crepitans</i>	
155.		<i>Deeringia celosioides</i>	228. Paraguay tea	<i>Ilex paraguensis</i>	
156.		<i>Derris dalbergioides</i>	229.		<i>Ipomoea Bona-nox</i>
157. Yam		<i>Dioscorea alata</i>	230.	„	<i>hederacea</i>
158.		„ <i>abyssinica</i>	231.	„	<i>centrocaulis</i>
159.		„ <i>bulbifera</i>	232.	„	<i>versicolor</i>
160.		<i>Dipterocarpus trinervis</i>	233.		<i>Iresine Herbstii</i>
161.		<i>Dolichandrone Hildebrandtii</i>	234.		<i>Jacaranda ovalifolia</i>
162. Pigeon berry		<i>Duranta Plumieri</i>	235. Columba root	<i>Jateorhiza Columba</i>	
163. Durian		<i>Durio Zibethinus</i>	236. Physic nut	<i>Jatropha Curcas</i>	
164. Oil palm		<i>Elaeis guineensis</i>	237. Bermuda cedar	<i>Juniperus bermudiana</i>	
165. Cardamom		<i>Elettaria Cardamomum</i>	238. Usambara cedar	„	<i>procera</i>
166. Cycad		<i>Encephalartos Hildebrandtii</i>	239.		<i>Kalanchoe glandulosa</i>
167.		<i>Englerodendron usambarense</i>	240.		„ <i>laterita</i>
168. Rain Tree		<i>Enterolobium Saman</i>	241. African mahogany	<i>Khaya senegalensis</i>	
169. Loquat		<i>Eriobotrya japonica</i>	242. Queen's flower	<i>Lagerstroemia Flos-reginae</i>	
170. Kapok		<i>Eriodendron anfractuosum</i>	243. Rubber vine	<i>Landolphia Kirkii</i>	
171.		<i>Eriodendron sp.</i>	244.	„	<i>Stolzii</i>
172. Immortel		<i>Erythrina tomentosa</i>	245.	„	sp.
173. Anauca, bocare		„ <i>velutina</i>	246.		<i>Leea sundaica</i>
174. Sassy bark		<i>Erythrophleum guineense</i>	247.		<i>Leucaena glauca</i>
175. Coca		<i>Erythroxylon Coca</i>	248.		<i>Lilium regale</i>
176.		„ <i>Coca</i> , var. <i>nova-granatense</i>	249. Palm	<i>Livistona australis</i>	
177.		<i>Eucalyptus angulosa</i>	250.	„	„ <i>chinensis</i>
178.		„ <i>amygdalina</i>	251.	„	„ <i>olivaeformis</i>
179. Lemon-scented gum	„	<i>citriodora</i>	252.		<i>Lucuma Rivicoa</i> var. <i>angustifolia</i>
180.		„ <i>corymbosa</i>	253. Lupins	<i>Lupinus luteus</i> , vars.	
181.		„ <i>corynocalyx</i>	254.		<i>Maesopsis Eminii</i>
182.		„ <i>eximia</i>	255. Mango	<i>Mangifera indica</i>	
183. Blue gum		„ <i>Globulus</i>	256.		<i>Manihot dichotoma</i>
184. Spotted gum		„ <i>maculata</i>	257. Ceara rubber	„	<i>Glaziovii</i>
185.		„ <i>paniculata</i>	258. Arrowroot	<i>Maranta arundinacea</i>	
186. Iron bark tree		„ <i>resinifera</i>	259. Palm	<i>Martinezia caryotaefolia</i>	
187.		„ <i>robusta</i>	260.		<i>Mascarenhasia elastica</i>
188. Red gum		„ <i>rostrata</i>	261.		<i>Melaleuca hypericifolia</i>
189.		„ <i>salubris</i>	262. Cajeputi	„	<i>Leucadendron</i>
190.		„ <i>Stuartiana</i>	263. Champak	<i>Michelia Champaca</i>	
191. Clove		<i>Eugenia caryophyllata</i>	264.		<i>Millettia ferruginea</i>
192.		„ <i>domestica</i>	265. Sensitive plant	<i>Mimosa pudica</i>	
193. Roseapple		„ <i>Jambos</i>	266. Calabash nutmeg	<i>Monodora myristica</i>	
194.		„ <i>javanica</i>	267. Horse radish tree	<i>Moringa pterygosperma</i>	
195. Malay apple		<i>Eugenia malaccensis</i>	268.		<i>Musa coccinea</i>
			269. Manila hemp	„	<i>textilis</i>
			270.		<i>Myrica mexicana</i>
			271.		<i>Myrianthus arboreus</i>



## Seeds available at the Biological and Agricultural Institute, Amani (Contd.).

272. Balsam of Peru	<i>Myroxylon Pereirae</i>	327.		<i>Randia sericantha</i>
273. Myrtle	<i>Myrtus communis</i>	328. Raffia palm		<i>Raphia pedunculata</i>
274. Rambutan	<i>Nephelium Lappaceum</i>	329.		sp.
275.	<i>Nicotiana affinis</i>	330. Travellers' tree		<i>Ravenala madagas-</i>
276.	" <i>suaveolens</i>			<i>cariensis</i>
277. Palm	<i>Oreodoxa oleracea</i>	331. Japan wax		<i>Rhus succedanea</i>
278. Palm	<i>Pandanus labyrinthicus</i>	332. Arum lily		<i>Richardia africana</i>
279.	" <i>Stuhlmannii</i>	333.		<i>Ricinodendron africanum</i>
280.	" <i>utilis</i>	334.		<i>Russelia juncea</i>
281.	<i>Parinarium Goetzenianum</i>	335. Palm		<i>Sabal Palmetto</i>
282.	" <i>Holstii</i>	336.		<i>Salvia splendens</i>
283.	<i>Parkia africana</i>	337.		<i>Sanchezia nobilis</i>
284. Candle tree	<i>Parmentiera cerifera</i>	338.		<i>Sandoricum indicum</i>
285.	<i>Passiflora edulis</i>	339. Soap berry		<i>Sapindus Saponaria</i>
286. Granadilla	" <i>quadrangularis</i>	340.		<i>Sapium sebiferum</i>
287.	<i>Pavetta</i> sp.	341.		<i>Schefflerodendron usambarense</i>
288.	<i>Paziodendron usambarense</i>	342.		<i>Schizolobium excelsum</i>
289.	<i>Payena Leerii</i>	343. Chayote: choco		<i>Sechium edule</i>
290.	<i>Peltophorum dasyrachis</i>	344.		<i>Solanum atropurpureum</i>
291. Butter tree	<i>Pentadesma butyracea</i>	345.		" <i>seaforthianum</i>
292.	<i>Pentas coccinea</i>	346. Tree solanum		" <i>Wrightii</i>
293.	" <i>purpurea</i>	347.		<i>Spondias dulcis</i>
294. Avocado pear	<i>Persea gratissima</i>	348. Hog plum		" <i>lutea</i>
295.	<i>Phlox Drummondii</i>	349.		<i>Statice sinuata</i>
296. Palm	<i>Phoenix canariensis</i>	350.		<i>Sterculia appendiculata</i>
297.	" <i>humilis</i>	351. Stave wood		" <i>foetida</i>
298.	" <i>sylvestris</i>	352.		" <i>Scheffleri</i>
299. New Zealand hemp	<i>Phormium tenax</i>	353.		<i>Strobilanthes dyerianus</i>
300. Otaheite goose- berry	<i>Phyllanthus distichus</i>	354. Barbatimao		<i>Strypnodendron Barbatimam</i>
301. Cape gooseberry	<i>Physalis peruviana</i>	355.		<i>Syncarpia laurifolia</i>
302.	<i>Pilocarpus pennatifolius</i>	356.		<i>Tabernaemontana Holstii</i>
303. Jaborandi	" <i>racemosus</i>	357. African marigold		<i>Tagetes erecta</i>
304.	<i>Pimenta acris</i>	358.		<i>Tecoma stans</i>
305. Long pepper	<i>Piper Chaba</i>	359. Teak		<i>Tectona grandis</i>
306. Black pepper	" <i>nigrum</i>	360. Mkweme		<i>Telfairia pedata</i>
307.	<i>Piptadenia Buchananii</i>	361.		<i>Tephrosia Vogelii</i>
308. Turpentine tree	<i>Pistacia Terebinthus</i>	362. Indian almond		<i>Terminalia Catappa</i>
309.	<i>Pithecolobium dulce</i>	363. Myrobalan		" <i>Chebula</i>
310.	" <i>Unguis-cati</i>	364.		<i>Tetrapleura Thonningii</i>
311.	<i>Pittosporum undulatum</i>	365. Cocoa		<i>Theobroma Cacao</i>
312.	<i>Pleomele elliptica</i>	366.		<i>Thespesia macrophylla</i>
313.	<i>Plumieria acutifolia</i>	367. Lucky bean		<i>Thevetia nerifolia</i>
314. Frangipani	" <i>alba</i>	368.		<i>Trachylobium hornemannianum</i>
315.	<i>Podocarpus usambarenis</i>	369. Okwa		<i>Treculia africana</i>
316.	<i>Polysphaera multiflora</i>	370. Mafureira seeds		<i>Trichilia emetica</i>
317. Flamboyante	<i>Poinciana regia</i>	371.		" <i>subcordata</i>
318. Brazilian guava	<i>Psidium Cattleianum</i>	372. Voa Vanga		<i>Vangueria edulis</i>
319. Guava	" <i>Guava</i>	373.		" <i>infausta</i>
320. Red guava	" <i>var. pomiferum</i>	374.		<i>Vinca alba</i>
321. White guava	" <i>var. pyriferum</i>	375.		" <i>rosea</i>
322.	<i>Psidium pumilum</i>	376.		<i>Widdringtonia Whytei</i>
323. Chinese guava	" <i>sinensis</i>	377.		<i>Zephyranthes carinata</i>
324. Palm	<i>Ptychococcus paradoxus</i>	378.		<i>Zanka golungensis</i>
325.	<i>Pterocarpus abyssinicus</i>	379. Ginger		<i>Zingiber officinale</i>
326.	<i>Randia Buchananii</i>			

F. M. ROGERS,  
Head Gardener.

## Seeds available at the Agricultural Station, Morogoro.

1. Red sandalwood	<i>Adenanthera pavonina</i>	13. Physic nut	<i>Jatropha Curcas</i>
2. Soursop	<i>Anona muricata</i>	14. Mango	<i>Mangifera indica</i>
3. Carambola	<i>Averrhoa Carambola</i>	15. Avocado pear	<i>Persea gratissima</i>
4. Annatto	<i>Bixa Orellana</i>	16. Brazilian guava	<i>Psidium Cattleianum</i>
5. Pawpaw	<i>Carica Papaya</i>	17. West Indian guava	" <i>Guava</i>
6. Whistling Willie	<i>Casuarina equisetifolia</i>	18.	" <i>pumilum</i>
7. West Indian cedar	<i>Cedrela odorata</i>	19. Chinese guava	" <i>sinensis</i>
8. Sweet orange	<i>Citrus Aurantium</i>	20. Pomegranate	<i>Punica Granatum</i>
9. Shaddock	" <i>decumana</i>	21. Hog plum	<i>Spondias lutea</i>
10. Lime	" <i>medica</i> var. <i>Limetta</i>	22. Teak	<i>Tectona grandis</i>
11. Tangerine	" <i>nobilis</i> var.		
12. Oil palm	<i>Elaeis guineensis</i>		

K. LATHAM,  
District Agricultural Officer.

## Seeds available at the Botanic Gardens, Dar es Salaam.

1. Cassie	<i>Acacia farnesiana</i>	33.	<i>Garc</i>
2. Baobab	<i>Adansonia digitata</i>	34.	<i>Gm</i>
3. Barricari seeds	<i>Adenanthera pavonina</i>	35. Logwood	<i>Haema</i>
4.	<i>Afzelia quanzensis</i>	36.	<i>Hy</i>
5. Lebbek: siris	<i>Albizia Lebbek</i>	37.	<i>H</i>
6. Cashew nut	<i>Anacardium occidentale</i>	38.	<i>I</i>
7. Soursop	<i>Anona muricata</i>	39. Coral flower	<i>Jatro</i>
8. Custard apple	„ <i>reticulata</i>	40. Cucumber tree	<i>Kigelia aetnuc</i>
9. Sweet sop	„ <i>squamosa</i>	41. Henna	<i>Lawsonia inermis</i>
10. Corallita	<i>Antigonon leptopus</i>	42. Pride of India	<i>Melia Azedarach</i>
11.	<i>Aristolochia elegans</i>	43. Sensitive plant	<i>Mimosa pudica</i>
12.	<i>Baphia Kirkii</i>	44. Horseradish tree	<i>Moringa pterygosperma</i>
13.	<i>Bauhinia acuminata</i>	45. Palm	<i>Oreodoxa oleracea</i>
14. Divi-divi	<i>Caesalpinia coriaria</i>	46.	<i>Pandanus livingstonianus</i>
15. Barbados pride	„ <i>pulcherrima</i>	47.	<i>Peltophorum ferrugineum</i>
16. Mtondoo	<i>Calophyllum Inophyllum</i>	48.	<i>Pithecolobium Unguis-cati</i>
17.	<i>Caryota mitis</i>	49. Flamboyante	<i>Poinciana regia</i>
18.	<i>Cassia alata</i>	50. Traveller's tree	<i>Ravenala madagas-</i> <i>cariensis</i>
19.	„ <i>grandis</i>	51. Palm	<i>Sabal mexicanum</i>
20. Whistling Willie	<i>Casuarina equisetifolia</i>	52. Soap berry	<i>Sapindus Saponaria</i>
21.	<i>Clitoria ternatea</i>	53.	<i>Schizolobium excelsum</i>
22. Seaside grape	<i>Coccoloba uvifera</i>	54.	<i>Solanum seafortianum</i>
23. Calabash tree	<i>Crescentia Cujete</i>	55.	<i>Sorindeia obtusifoliata</i>
24.	<i>Cryptostegia grandiflora</i>	56.	<i>Sterculia alata</i>
25. Rosewood of S. India	<i>Dalbergia latifolia</i>	57. Stave wood	„ <i>foetida</i>
26. Oil palm	<i>Elaeis guineensis</i>	58.	<i>Strychnos Volkensii</i>
27.	<i>Encephalartos Hildebrandtii</i>	59. Tamarind	<i>Tamarindus indica</i>
28. Rain tree	<i>Enterolobium Saman</i>	60. Teak	<i>Tectona grandis</i>
29. Java plum	<i>Eugenia Jambolana</i>	61. Indian almond	<i>Terminalia Catappa</i>
30.	<i>Ficus Bussei</i>	62.	„ <i>Arjuna</i>
31. Sycamore fig	<i>Ficus Sycomorus</i>	63. Lucky bean	<i>Thevetia nerifolia</i>
32.	„ <i>Volkensii</i>		

T. H. MARSHALL,  
Head Gardener.

The above seeds may be obtained from the stations mentioned in packets at Shs. 0/50 or Shs. 1/00. All requests for seeds should be accompanied by a remittance in full payment for them.

A. H. KIRBY,  
Director of Agriculture.



## APPENDIX III.

## GINNERIES EXISTING IN 1926-27.

No.	District.	Locality.	Number of gins.		Licensee.
			Saw.	Roller.	
1	Dar es Salaam ...	Pugu ...	2	12	Abdulrasul and Sons.
2	" ...	Dar es Salaam ...	1	16	Rosehaugh Company.
1	Morogoro ...	Morogoro ...	1	28	"
2	" ...	Mikese ...	3	12	Japan Cotton Trading Co.
3	" ...	Ngerengere ...	1	7	Rosehaugh Company.
4	" ...	Mlali ...	—	18	Tanganyika Cotton Co.
5	" ...	Duthumi ...	—	8	"
1	Kilosa ...	Kilosa ...	—	14	Rosehaugh Company.
2	" ...	Rudewa ...	—	20	Tanganyika Cotton Co.
3	" ...	Mkata ...	—	12	Karimjee Jivanjee & Co.
4	" ...	Msowero ...	—	6	E. Kladites.
5	" ...	Turiani ...	—	—	Tanganyika Cotton Co.
1	Rufiji ...	Kilimani ...	—	2	L. Horn.
2	" ...	Logeloge ...	—	12	"
3	" ...	Betya ...	—	6	Rosehaugh Company.
1	Bagamoyo ...	Bagamoyo ...	1	5	Holy Ghost Mission.
1	Lindi ...	Lindi ...	—	14	Mathuradas Kalidas.
2	" ...	" ...	—	14	Rosehaugh Company.
1	Kilwa ...	Kikanda ...	1	7	"
1	Tanga ...	Tongoni ...	1	10	G. Galanos.
1	Usambara ...	Kwashemshi ...	2	—	Coastal Trading Co.
1	Handeni ...	Mamunda ...	—	—	"
1	Moshi ...	Moshi ...	—	2	N. Dadani.
2	" ...	Himo ...	1	12	Shariff Jiwa and Co.
3	" ...	Himo ...	—	2	A. Mongardi.
4	" ...	Himo ...	1	1	E. Deusebis.
1	Mbulu ...	Ndulu ...	—	5	Themi Coffee Estate.
1	Shinyanga ...	Usagore ...	4	—	B. E. A. Corporation.
2	" ...	Luhombo ...	4	—	"
1	Mwanza ...	Mwanza ...	—	14	Nakasero Trading Co.
2	" ...	Murutunguru (Ukerewe Island)	1	10	B. E. A. Corporation.
3	" ...	Ihale ...	—	6	G. H. Abdrasul & Co.
4	" ...	Nyambiti ...	2	6	B. C. G. Association.
5	" ...	Nyanguge ...	2	5	"
6	" ...	Pambani ...	—	10	Kampala Genl. Agency.
7	" ...	Runere ...	5	—	B. E. A. Corporation.
8	" ...	Malampaka ...	5	—	"
9	" ...	Bukumbi ...	—	12	Bwagwanji Sunderji.
10	" ...	Nasa ...	—	12	G. Boschetti.

## APPENDIX IV (A).

## TANGANYIKA TERRITORY—RAINFALL IN MILLIMETRES, 1925.

METEOROLOGICAL STATION.	Alt. Feet	Lat. S	Long. E	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR'S TOTAL
Arusha ...	4,416	3°23'	36°43'	114.6	55.4	110.0	43.9	18.0	19.6	19.9	9.3	4.6	123.3	499.0	137.9	1,155.5
Mbulu ...	5,900	3°52'	35°37'	193.6	92.2	101.9	47.8	16.9	Nil	Nil	Nil	22.9	30.7	267.8	90.3	864.1
Bagamoyo ...	S.L.	38°55'	38°55'	342.8	70.4	84.0	61.6	83.8	33.0	39.7	34.8	74.4	115.7	90.7	229.6	1,260.5
Bukoba ...	3,709	1°20'	31°47'	173.9	139.3	285.2	151.1	255.7	125.8	47.0	120.9	122.6	103.0	281.7	77.7	1,893.9
Biharamulo ...	4,350	2°42'	31°26'	139.7	110.5	208.5	40.1	113.2	64.5	Nil	39.4	34.5	32.8	156.0	129.5	1,068.90
Dar es Salaam ...	30	6°50'	39°17'	215.9	116.8	58.4	111.8	53.3	40.6	38.1	Nil	38.1	53.3	149.9	320.0	1,196.2
Ruvu ...	118	6°48'	38°45'	215.5	127.7	72.3	90.1	69.9	32.1	14.5	13.0	76.4	136.0	121.0	56.4	1,024.9
Soga ...	508	—	—	270.8	184.9	85.9	188.5	30.2	8.6	2.0	20.3	60.5	67.8	191.3	125.7	1,236.5
Dodoma ...	3,693	6°11'	35°46'	312.0	88.0	23.1	11.2	Nil	Nil	Nil	Nil	Nil	Nil	52.4	108.2	595.0
Manyoni ...	4,135	5°39'	34°07'	254.7	49.2	100.3	14.1	9.1	Nil	Nil	Nil	Nil	26.9	209.7	53.6	698.8
Singida ...	5,233	4°48'	34°45'	246.7	63.6	99.1	Nil	Nil	3.0	Nil	Nil	Nil	Nil	134.5	151.6	725.4
Mvumi Mission ...	3,300	5°00'	35°00'	12.0	36.4	2.4	Nil	Nil	Nil	Nil	Nil	Nil	5.1	54.1	205.0	340.1
Buigiri ...	—	—	—	299.7	50.0	36.1	14.0	Nil	Nil	Nil	Nil	Nil	Nil	105.0	137.1	663.1
Iringa ...	5,365	7°47'	35°37'	241.6	55.7	103.2	12.0	4.6	3.2	0.7	Nil	12.4	Nil	14.5	233.6	654.6
Malangali ...	4,775	8°35'	30°00'	153.9	122.0	83.1	34.3	0.8	Nil	Nil	Nil	2.3	Nil	77.0	4.1	673.6
Madibira ...	3,598	8°00'	34°08'	237.2	110.2	49.5	80.5	10.7	Nil	Nil	Nil	13.1	62.0	64.5	105.4	739.6
Kilwa ...	S.L.	8°44'	39°25'	139.9	171.0	61.0	77.4	39.2	6.1	Nil	Nil	Nil	19.0	61.4	169.2	1,229.8
Liwale ...	1,500	9°45'	38°00'	257.0	391.3	43.7	180.0	105.4	Nil	Nil	2.8	Nil	75.1	328.1	175.2	1,335.7
Kibata ...	1,700	8°50'	39°00'	292.4	190.7	169.9	191.0	93.3	31.0	Nil	26.0	53.0	44.8	18.0	76.7	477.6
Kondoa Irangi ...	4,610	4°57'	35°38'	213.5	76.8	39.0	7.7	1.1	Nil	Nil	Nil	Nil	1.0	88.3	169.3	936.8
Lindi ...	S.L.	10°00'	39°43'	185.6	151.0	93.6	193.7	50.0	2.2	1.1	1.0	Nil	Nil	Nil	81.1	1,227.6
Tunduru ...	2,300	11°05'	37°27'	543.3	112.2	160.2	122.0	22.8	Nil	7.0	179.0	Nil	2.2	42.2	117.6	1,221.6
Masasi Mission ...	1,505	10°42'	38°55'	325.6	184.2	219.9	253.4	55.4	Nil	Nil	13.0	8.1	Nil	2.8	7.2	328.1
Mikindani ...	—	10°16'	40°07'	18.6	13.5	12.8	266.4	5.8	0.7	Nil	Nil	0.0	Nil	55.5	321.3	1,362.0
Mafia Island (Kilindoni) ...	63	7°55'	39°45'	201.4	167.4	170.9	168.0	189.8	52.5	8.5	2.5	12.2	12.0	100.3	66.4	778.1
Morogoro ...	1,628	6°48'	37°46'	217.5	117.9	43.2	61.1	63.5	41.0	20.6	10.5	5.5	30.6	35.5	311.9	1,045.8
Kilosa ...	1,606	6°48'	37°01'	98.3	246.8	60.9	134.4	50.0	57.5	Nil	23.5	2.3	24.7	106.5	40.0	972.7
Ngerengere ...	641	6°47'	38°08'	168.9	130.0	84.0	95.3	105.0	24.0	7.5	31.0	72.5	107.0	158.9	66.8	660.5
Moshi ...	2,649	3°22'	37°22'	115.9	19.5	65.2	20.2	46.5	7.1	35.0	21.2	11.2	93.0	385.2	229.4	1,933.9
Kilema Mission ...	4,703	3°19'	37°29'	177.8	184.7	202.1	95.6	71.7	115.7	45.1	151.0	71.1	104.5	—	—	—



TANGANYIKA TERRITORY—RAINFALL IN MILLIMETRES, 1925—continued.

METEOROLOGICAL STATION	Alt. Feet	Lat. S	Long. N	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	YEAR'S TOTAL
Mweka Estate	...	...	...	53.0	26.0	57.5	50.5	144.5	34.9	75.8	82.0	3.5	73.7	86.7	81.1	769.2
Mahenge...	3,352	8°40'	36°43'	214.1	277.0	182.0	211.0	132.8	29.5	Nil	Nil	14.0	27.0	65.0	217.5	1,369.9
Mwanza...	3,709	3°32'	32°53'	208.3	50.8	257.5	32.8	89.1	52.8	Nil	21.6	Nil	29.5	247.9	89.1	1,079.3
Musoma...	3,709	1°28'	33°47'	106.2	76.9	124.3	36.9	45.6	55.4	28.2	61.2	5.1	51.7	155.4	101.9	850.8
Pangani...	S.L.	5°25'	38°58'	28.4	102.1	76.5	46.4	45.9	46.3	63.1	91.2	69.9	262.0	131.4	53.3	1,016.5
Utete	327	8°00'	38°45'	132.6	135.1	72.0	70.5	70.0	8.5	Nil	Nil	11.0	41.0	161.2	77.4	779.3
Mpanganya	105	8°05'	38°40'	188.5	144.5	58.8	122.2	49.7	5.5	1.4	8.0	8.7	16.4	93.7	103.6	801.0
Tukuyu	5,069	9°15'	33°38'	176.5	235.8	297.7	231.5	610.7	110.4	115.9	10.7	254.4	25.7	183.5	249.6	2,521.6
Livingstonia Mission (Kimbila)	4,400	9°15'	33°40'	195.7	14.4	9.7	11.0	20.0	3.9	5.1	0.4	11.6	2.3	7.0	176.5	438.6
Igala	—	—	—	305.8	124.9	93.2	78.2	24.6	Nil	8.3	Nil	Nil	Nil	33.0	118.3	786.3
Isoko Mission	—	—	—	9.3	16.5	16.0	23.5	10.2	1.8	2.4	Nil	0.8	0.5	8.1	8.2	97.5
Songea...	3,826	10°42'	35°40'	239.2	308.4	306.9	203.7	35.2	Nil	Nil	Nil	Nil	Nil	43.7	191.8	1,328.9
Lipumba	3,270	10°48'	35°05'	164.6	244.2	271.7	184.4	32.2	6.0	3.2	Nil	0.8	15.0	96.8	221.8	1,227.8
Milo	8,300	10°04'	34°39'	245.8	255.5	354.3	220.2	138.8	2.8	5.0	Nil	Nil	Nil	72.6	312.7	1,622.7
Lituhu Mission	—	—	—	1,160.0	959.0	524.0	411.0	436.0	5.0	19.0	Nil	Nil	Nil	93.0	326.0	3,933.0
Tabora	4,000	5°00'	32°00'	118.6	122.3	183.2	8.5	22.7	3.4	Nil	Nil	0.6	62.0	589.2	192.9	1,303.4
Kahama	4,055	3°35'	32°33'	148.1	117.4	291.8	34.8	44.3	27.8	Nil	Nil	Nil	51.7	201.7	122.7	1,040.3
Kola'Ndota Mission	4,400	3°34'	33°19'	100.5	76.9	136.9	44.4	49.5	17.5	Nil	Nil	Nil	Nil	221.2	145.4	792.3
Ushirombo	—	—	—	120.8	79.8	190.7	58.4	65.1	114.8	Nil	5.7	6.0	93.4	255.3	133.1	1,123.1
Nzega	—	4°15'	33°08'	112.7	53.5	205.5	39.4	43.0	7.4	Nil	Nil	Nil	34.0	361.6	83.2	940.3
Tanga	S.L.	5°40'	39°07'	100.0	42.0	44.5	48.0	52.9	107.5	71.7	138.4	56.5	266.8	71.1	149.6	1,149.0
Amani	3,004	5°06'	38°38'	92.5	231.7	95.4	121.6	130.4	160.6	136.5	137.6	137.2	485.2	346.1	216.2	2,291.0
Kate Mission	—	—	—	209.0	144.0	275.6	15.0	131.8	50.0	3.3	Nil	92.5	65.3	294.4	199.1	1,480.2
Kala	—	—	—	1,222.0	715.0	401.0	107.0	218.0	6.0	Nil	Nil	5.0	310.0	848.0	969.0	4,801.0
Kigoma	2,531	4°52'	29°38'	94.2	121.3	172.8	61.2	57.2	93.3	9.0	Nil	20.0	75.0	223.3	238.0	1,165.3
Ujiji	2,738	4°59'	29°47'	108.1	148.0	169.5	23.8	56.6	59.9	4.1	Nil	4.5	52.3	135.7	216.8	979.3
Kasulu	4,530	4°35'	30°07'	240.0	194.0	209.4	27.0	50.0	33.5	Nil	0.5	41.5	114.0	176.0	237.8	1,323.7
Lushoto	4,579	4°47'	38°17'	160.3	34.40	148.2	168.6	70.2	32.0	57.9	32.6	Nil	89.9	282.7	166.6	1,143.4
Sakare	4,500	5°00'	38°25'	192.8	23.0	80.7	30.3	51.0	99.1	131.6	124.3	83.5	319.9	184.8	63.1	1,584.1
Suji	—	—	—	262.2	103.8	208.1	32.2	14.5	1.9	2.5	1.9	1.2	82.7	183.7	166.4	1,061.1
Kurio	4,101	5°20'	35°20'	156.2	119.5	94.9	10.0	20.7	Nil	Nil	Nil	Nil	5.1	92.3	52.5	550.2

Total number of Stations: 61.

Months	AIR TEMPERATURE (DEGREES CENTIGRADE) (Time of Observations: 9 a.m.)										TENSION OF VAPOUR				RELATIVE HUMIDITY							
	Mean		7		9		Mean		Min.		Date		Max.		Date		7		9		Mean	
	Pressure		1		9		Mean		Min.		Max.		Date		Max.		1		9		Mean	
January	...	...	...	27.0	24.0	30.0	21.0	6, 13, 15.	33.0	1.	39.5	89.0	90.0	90.0	39.5							
February	...	...	...	27.0	24.0	30.0	22.0	1, 23, 28.	33.0	7.	90.5	90.0	91.0	90.5								
March...	...	...	...	27.0	23.0	31.0	21.5	18.	33.0	21, 22, 29.	87.5	88.0	87.0	87.5								
April ...	...	...	...	26.5	22.5	30.5	21.0	12, 13, 14, 15.	34.5	16, 17.	90.0	90.0	90.0	90.0								
May ...	...	...	...	26.0	21.5	30.5	19.0	17.	33.0	23.	87.5	89.0	86.0	87.5								
June ...	...	...	...	25.0	20.5	30.0	17.0	28, 29.	32.0	1, 2.	85.5	90.0	81.0	85.5								
July ...	...	...	...	23.0	18.5	27.5	17.5	22.	32.0	26.	84.5	88.0	81.0	84.5								
August ...	...	...	...	24.5	19.5	29.5	17.5	2, 3.	31.0	5, 20, 21, 22.	79.0	80.0	78.0	79.0								
September	...	...	...	24.5	20.0	28.5	18.5	1, 2, 13.	31.0	3, 23, 27, 28.	86.0	88.0	84.0	86.0								
October	...	...	...	26.0	21.5	30.0	20.0	18.	31.5	21, 22.	86.5	87.0	86.0	86.5								
November	...	...	...	27.0	23.5	30.5	22.0	11, 14, 19.	32.5	28.	89.5	91.0	88.0	89.5								
December	...	...	...	28.0	24.5	31.0	21.5	19.	33.0	30.	89.5	91.0	88.0	89.5								

Months	Rainfall in millimetres on any one day (Time of Observations: 9 a.m.)				Weather Number of days of				Wind Number of Observations of																									
	Total for month		Date		Thunder Storms		Clear sky		Over- cast		Gales		N.		N.E.		E.		S.E.		S.		S.W.		W.		N.W.		Calm.					
	7		9		1		9		Mean		1		9		Mean		7		9		Mean		7		9		Mean		7		9		Mean	
January	...	...	...	6.96	215.90	58.42	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13			
February	...	...	...	4.17	116.84	20.32	26	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12			
March ...	...	...	...	1.88	58.42	40.64	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5			
April ...	...	...	...	3.73	111.76	22.86	29	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
May ...	...	...	...	1.72	53.34	30.48	5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9			
June ...	...	...	...	1.35	40.64	10.16	8, 24	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7			
July ...	...	...	...	1.23	38.10	22.86	7	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3			
August ...	...	...	...	Trace	Trace	Trace	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
September	...	...	...	1.27	38.10	12.70	22	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4			
October	...	...	...	1.88	53.34	25.40	2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11			
November	...	...	...	4.99	149.86	30.48	12	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
December	...	...	...	10.32	320.04	93.98	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			



STATION: ARUSHA, 1925.

Longitude, 36° 43' E.      Latitude, 3° 23' S.      Altitude 4,416 feet.

Months	AIR TEMPERATURE (DEGREES CENTIGRADE) (Time of Observations: 9 a.m.)					TENSION OF VAPOUR			RELATIVE HUMIDITY		
	Mean Pressure	Mean of		Absolute Min. and Max.		Date			Date		
		Min.	Max.	Min.	Max.	7	1	9	Mean	9 a.m.	4 p.m.
January	...	20.5	27.5	11.0	31.0	24.	26.	10, 11, 13, 14, 15, 16.	26.		
February	...	21.5	30.0	10.0	32.0	11.	10, 11, 13, 14, 15, 16.	15, 16, 17, 18, 19,	11.		
March	...	21.5	28.0	12.0	30.0	17.	20, 21.	19, 26.	12.		
April	...	22.0	28.0	14.0	30.0	12.	18, 29, 30.	6, 7, 17, 19, 21.	16.		
May	...	21.5	28.0	14.0	30.0	16.	2, 21.	1.	8.		
June	...	19.5	25.0	11.5	28.0	18, 29, 30.	13.	16.	27.5		
July	...	18.5	23.5	11.5	27.0	2, 21.	12, 25, 30.	3, 4, 5, 6, 7.	29.		
August	...	18.5	25.0	10.5	27.5	13.	7.	9, 29, 30, 31.	16.		
September	...	20.5	28.0	11.0	33.0	12, 25, 30.	1.		32.0		
October	...	21.5	28.0	13.0	28.0	7.	30.		28.0		
November	...	21.0	26.0	13.0	29.0	30.			29.0		
December	...	20.5	26.0	12.5	29.0	29, 30, 31.					

Months	Rainfall in millimetres on any one day (Time of Observations 9 a.m.)				Weather Number of Days of					Wind Number of Observations of				
	Amount of Cloud		Total for month		Rain.	Snow.	Hail.	Thunder Storms	Clear Sky.	Over-cast	Gales	N.	N.E.	E.
	7	1	9	Mean										
January	...	...	...	3.7	114.6	24.8	5							
February	...	...	...	2.0	55.4	30.0	21							
March	...	...	...	3.6	110.0	42.5	28							
April	...	...	...	1.5	43.9	13.6	27							
May	...	...	...	0.6	18.0	4.5	4							
June	...	...	...	0.7	19.6	4.8	10							
July	...	...	...	0.6	19.9	13.6	7							
August	...	...	...	0.3	9.3	2.8	29							
September	...	...	...	0.2	4.6	2.0	19							
October	...	...	...	4.0	123.3	45.0	31							
November	...	...	...	15.0	449.0	81.5	18							
December	...	...	...	4.5	137.9	53.0	11							

STATION: MANYONI (DODOMA DISTRICT), 1925.

Longitude, 34° 07' E.      Latitude, 5° 39' S.      Altitude, 4,135 feet.

Months	AIR TEMPERATURE (DEGREES CENTIGRADE) (Time of Observations: 9 a.m.)										TENSION OF VAPOUR				RELATIVE HUMIDITY		
	Mean			Mean of		Min.	Date	Absolute Min. and Max.		Date	7	1	9	Mean	9 a.m.	4 p.m.	Mean
	7	1	9	Min.	Max.			Max.	Max.								
	Pressure																
...	...	...	...	21.5	18.0	25.0	12.0	25.	28.5	26, 28. 12.							
January	...	...	...	20.0	14.0	25.5	12.0	5.	28.5	21.							
February	...	...	...	21.0	14.0	27.5	11.5	14.	30.5	17, 25.							
March	...	...	...	21.0	14.5	27.5	11.5	13.	30.0	7, 8, 10, 18, 19.							
April	...	...	...	21.5	14.0	28.5	11.0	29.	30.0	1, 4, 14, 16, 18, 21, 23, 25.							
May	...	...	...	20.0	12.5	27.5	8.0	29.	29.0	17, 21, 25.							
June	...	...	...	17.5	11.0	24.5	9.0	1, 4.	27.0	12, 13, 15, 16, 22.							
July	...	...	...	19.0	11.0	26.5	8.0	3.	28.0	10, 15, 22, 25, 29, 30,							
August	...	...	...	20.0	12.0	28.5	8.0	17.	30.0	21, 23, 28.							
September	...	...	...	21.5	13.0	30.0	10.0	1.	32.0	5, 6, 7, 8, 9, 10, 12, 13, 16, 17, 19.							
October	...	...	...	22.0	14.5	29.5	11.0	6.	31.0	27, 28, 29, 31.							
November	...	...	...	20.5	13.0	28.0	12.0	1, 2, 18, 25, 26, 27.	30.0								
December	...	...	...														

[illegible]





STATION: AMANI (TANGA DISTRICT), 1925.

Longitude, 38° 38' E.      Latitude, 5° 6' S.      Altitude, 3,004 feet.

Latitude,  $5^{\circ} 6' S.$

Longitude,  $38^{\circ}38' E$ .

Altitude, 3,004 feet.

Months	Mean Pressure	AIR TEMPERATURE (DEGREES CENTIGRADE) (Time of Observations : 9 a.m.)							TENSION OF VAPOUR			RELATIVE HUMIDITY		
		7	1	9	Mean of		Absolute Min. and Max.		7	1	9	Mean	4 p.m.	Mean
					Min.	Max.	Min.	Date						
January	...	...	...	21.5	17.0	26.5	11.0	23, 24.	28.0	1, 2, 4, 7, 8, 13, 21, 22, 25, 26, 30, 31.				
February	...	...	...	22.0	17.0	27.0	15.0	19.	30.0	8.				
March	...	...	...	22.0	17.0	27.0	15.0	20.	28.0	2, 3, 13, 14, 15, 17, 18, 19, 20, 21, 22, 25, 26, 30, 31.				
April	...	...	...	22.0	17.0	27.0	15.5	13.	29.0	18.				
May	...	...	...	21.0	17.0	25.0	15.0	30.	29.0	2.				
June	...	...	...	19.5	16.0	23.5	12.0	8.	25.0	5, 14, 15, 19, 20.				
July	...	...	...	18.5	15.5	22.0	14.0	10, 14, 20, 21, 24, 28, 31.	24.0	26.				
August	...	...	...	18.5	14.5	22.0	12.0	12.	24.0	3, 7.				
September	...	...	...	19.0	14.5	23.5	12.0	28.	25.0	30.				
October	...	...	...	21.0	16.5	25.0	12.0	22.	27.0	20, 22, 30,				
November	...	...	...	22.0	17.0	26.5	15.0	1, 2, 3, 7.	28.5	7, 30.				
December	...	...	...	22.5	18.0	26.5	15.0	17.	28.0	9, 16, 21, 27, 29, 30.				

[illegible]



## BIOLOGICAL AND AGRICULTURAL INSTITUTE, AMANI.

## ABSTRACT OF REPORT FOR THE YEAR, 1925-26.

## 1. The following plantings were carried out during the year:—

- (a) *Hovenia dulcis* (coral tree).—A small area was planted with this species.
- (b) *Eucalyptus* spp.—280 plants of 15 different species of *Eucalyptus* were planted out.
- (c) *Juniperus Cedrus* and *Juniperus bermudiana*.—Plants of both these species raised from seed sent from Kew in 1924 were planted out and are doing well.
- (d) *Melinis minutiflora* (efwatakala grass).—A new plot of this grass was sown in the Nursery garden in December, and is now in good condition. Two plots were also planted up in January, one at Lunguza Bridge on the Amani-Muheza road, and one at Kiwanda; both places are known to be tsetse-infested and should afford good opportunity for investigation of this grass as a repellent.
- (e) Ginger (*Zingiber officinale*).—Nearly 700 kgs. of Jamaica ginger were obtained from the nursery plantings. 250 kgs. were distributed for native planting about Amani and 280 kgs. to European planters. About 138 kgs. have also been planted up in the nursery for further distribution this year.
- (f) Soya Beans (*Glycine hispida*).—Twelve samples of soya beans were received from Agricultural Headquarters for trial at Amani and Sigi. These were sown but were not successful. A further experiment is being made.
- (g) *Centrosema pubescens*.—Two beds of this cover crop were sown in the nursery and are doing well, covering the whole beds with a thick carpet of foliage.

## 2. Distribution of planting material was as follows:—

(a) Seeds.										Packets.
Coffee	...	...	...	...	...	...	...	...	...	23 & 144 lb.
Ornamental plants	...	...	...	...	...	...	...	...	...	143
Fruits	...	...	...	...	...	...	...	...	...	89
Cacao	...	...	...	...	...	...	...	...	...	3
Shade trees and wind breaks	...	...	...	...	...	...	...	...	...	23
Palms	...	...	...	...	...	...	...	...	...	29
West African oil palm	...	...	...	...	...	...	...	...	...	— 7 lb.
Spices	...	...	...	...	...	...	...	...	...	10
Cinchona	...	...	...	...	...	...	...	...	...	11
Economic plants other than the above	...	...	...	...	...	...	...	...	...	156
Total										487 & 151 lb.

## (b) Plants.

<i>Eugenia caryophyllata</i> (Clove)	...	...	...	...	...	...	...	300
<i>Areca Catechu</i> (Areca nut)	...	...	...	...	...	...	...	6
<i>Plumbago capensis</i>	...	...	...	...	...	...	...	3

1 parcel of *Elettaria Cardamomum*.

1 parcel of bulbs.

530 kgs. ginger.

6 bundles of ornamental plant cuttings.

2 bundles of bamboo cuttings.

3. No serious plant pests or diseases were observed during the year. Locusts were much fewer in number than usual. This again was probably on account of the unusually heavy rains during the last three months of the calendar year.

## APPENDIX VI.

## ENTOMOLOGICAL REPORT, 1925-26.

1. *Collections*.—The collection of insects includes 1,280 species identified by the Imperial Bureau of Entomology.

2. *Publications*.—Four articles have appeared in the *Tanganyika Times* and three articles in *Mambo Leo*. Leaflet No. 3, "What to do at the End of the Cotton Season and Why" was submitted and published.

3. *Plant Identifications*.—

- (a) Two further parasites of sorghum have been identified at Kew, namely *Striga forbesii*, Benth., and *Harveya obtusifolia*, var., *Stuhlmannii*, Engl.
- (b) The common *Strophanthus* ("msungululu") of the Territory occurring widely distributed in the Dodoma and Tabora area has been identified as *S. Eminii*, Aschers and Pax, and seed was forwarded for chemical test.

4. *Plant Diseases*.—

- (a) In connection with work on the African grain smuts, the following were identified by the Division of Botany, Pretoria:—

*Sphacelotheca sorghi* (Lk.) Clinton.  
*Sphacelotheca cruenta* (Kuehn) Potter. } on *Andropogon Sorghum*.  
*Ustilago reiliana*, Kuehn. }

*Sphacelotheca cruenta* (Kuehn) Potter on *Sorghum verticilliflorum* (grass).  
*Sphacelotheca monolifera* (Ell. and Ev.) Clinton, on *Heteropogon contortus* (grass).  
*Ustilago* sp. on *Hyparrhenia cymbaria* (grass).  
*Ustilago flagellata*, Syd. on *Rottboellia exalta* (grass).

- (b) The following diseases were identified by the Imperial Bureau of Mycology occurring on Bulrush Millet (*Pennisetum typhoideum*):—

*Puccinia Penniseti*, Zimm., Leaf Rust.  
*Sclerospora graminicola*, Schroet., Downy Mildew.  
*Tolyposporium penicillariae*, Bref., Smut.  
*Sphacelia* sp., Asali Disease.

The latter, Asali Disease, can prove a serious pest of millet and merits close study. The first indication of the affection is a small droplet of pinkish fluid exuding from the gynoeceum. These droplets later darken and the seed head is matted down with the blackened sticky exudate from affected gynoeceia. A similar affection of millet has been observed on the Gold Coast and the Sudan and in Kenya a disease of a closely similar nature is reported to occur on sorghum.

- (c) Areolate mildew, *Ramularia areolae*, Atk., was identified on cotton but the disease has not so far proved to be of economic importance.
- (d) In connection with investigations on hard-grained insect-resistant sorghums for export, white grained types from the Tabora District when grown at Morogoro Agricultural Station were observed to become of inferior colour, being blotched and speckled with deep red and so would be discriminated against for export. The Imperial Bureau of Mycology reported that while a *Fusarium* and a *Colletotrichum* were present in such grain, their occurrence was not sufficiently regular to warrant the belief that it caused the reddening. The blotched grain then may be looked upon as colour forms of the white due probably to change of soil and weather conditions.
- (e) Eleven varieties of sorghum were on trial at Morogoro Agricultural Station with a view to making observations on their resistance to sorghum head smuts, *Sphacelotheca sorghi*, and *S. cruenta*. On the primary heads only one plant of dwarf blackhull showed evidence of attack, but it is to be recalled that the season was peculiarly dry and it is doubtful if this resistance would be maintained in one of normal rainfall. Infection of *S. cruenta* showed up in the ratoon crop as follows:—

Dwarf White Kaffir	...	...	...	...	2.5 per cent.
Dwarf Blackhull Kaffir	...	...	...	...	2.1 ,,
Pink Kaffir	...	...	...	...	2.4 ,,

The infection, however, was in rows of these imported varieties growing in proximity to rows of local sorghums which by this time were showing primary head smut infection. The infection suggested that there had been direct infection of these secondary blossom heads from the primary infected heads of the local sorghums. The possibility of ratooning such quick-maturing imported sorghum types is rendered practically negligible by the serious onset on the ratoons of *Puccinia purpurea*, as was the case with Sudan sorghums.

5. *Beekeeping*.—There has been considerable propaganda in the Tabora administrative area for the adoption of the Sudan pattern beehive designed for the purpose of saving the bee brood on the occasion of each gathering of honey. Circular queen excluders for use with the hives have been distributed and an illustrated leaflet in Swahili explaining the manner of using the hive is in course of preparation. In course of work in native bee-keeping it has been observed that the large and the lesser wax moths are responsible for considerable losses.



6. *Silk Culture*.—A report was received through the Imperial Bureau of Entomology from the Silk Production Committee of the Imperial Institute on nests of *Anaphe panda*, Boisd., and *Diapalpus congregarius*, Strand. The Committee stated that under present circumstances the utilisation of *Anaphe* nests in Great Britain did not appear to be a commercial proposition chiefly on account of the difficulties of degumming and the relatively low yield of combed silk. The nests of *Diapalpus* were considered to possess no commercial value on account of the difficulty and cost of freeing them from the great quantity of dirt and débris contained in them. A beginning has been made at Morogoro with seven pure strains of Mulberry silk, *Bombyx mori*.

7. *Forest Insects*.—An isopod crustacean attacking mangroves in the Rufiji River delta was identified by Dr. Calman of the British Museum as *Sphueroma terebrans*, S.B. This species is found boring in timber generally in brackish or fresh water throughout the tropics. A galericid beetle, *Exora* sp., was submitted as destroying the foliage of the Usambara camphor, *Ocotea usambarensis*. Cockchafer grubs have given considerable trouble in forest nurseries but staff is not available for a full investigation of the problem. Several species of *Anomala* and *Adoretus* are concerned.

8. *Insects Affecting Livestock*.—A muscid, the larvæ of which were the cause of myiasis of cattle at the Veterinary Laboratory, was identified as *Chrysomya bezziono*, Vill. A special memorandum was submitted on the so-called Mystery worm, *Laphygma exempta*, Wlk. The caterpillars of this noctuid appear suddenly annually in various parts of the Territory and do widespread damage to grass and native crops. The season of occurrence is, as a general rule, December and January. Some tribes associate the visitation of the caterpillars with a fatal disease of cattle. This point, however, requires careful investigation. While poison baiting and treatment of crops and pasture is possible in non-native plantations, the task of coping with the pest on the native reserves is extremely difficult as there is always the risk of stock being driven back over the poisoned pastures. The distribution of poisons to natives for use on crops is for the present considered inadvisable. The *Laphygma* is generally heavily parasitised. The brood present in Dar es Salaam in December showed parasitism of over 33 per cent. The parasites included several species of Tachinid flies, *Paniscus luteolus*, Tosq. (Ichneumonidae), and *Disophrys* sp. (Braconidae). The Sangala ant, *Plagiolepis vestita*, Sm., common on the sandier soils, was also observed carrying off the caterpillars.

9. *Insects Affecting Man*.—The following Anopheline mosquitoes were reared in Morogoro at a time when malaria was seriously affecting the non-native and native agricultural staff: *Anopheles costalis*, Theo., *A. funestus*, Giles, *A. pretoriensis*, Theo., and *A. marshalli*, Theo. The first was the most prominent species breeding in riverside flood-water, grass-grown pools from 1,800 ft. to just under 4,000 ft. There was no trace of mosquito breeding in coconut palms either on the Experiment Station or in the township; nor when buckets of water were actually poured quickly into the crest of the palms did water remain to make artificial breeding places. *Aedes argenteus*, Poir. (*Stegomyia fasciata*, F.) could be induced to breed in small tins suspended under the foliage of coconut palms and pawpaws. *Culex horridus*, Edw., and *C. fatigans*, W., were reared from two surface wells at the Agricultural Station and from chance collections of water in paint cans, cesspits, etc. The clearing of trees and bush from the banks of the Morogoro stream (the place of the breeding grounds of *Anopheles costalis*) and from Government quarters has been beneficial.

10. *Maize Pests*.—Boring caterpillars have in the past season been responsible for considerable losses in maize fields. The species principally concerned is *Diatraea argyrolepida*, Hmps., which bores both in the stem and the cob. Species of less importance recorded are *Sesamia calamistis*, Hmps., *Busseola fusca*, Fuller, and *Chloridea obsoleta*, F. The destruction wrought by the *Diatraea* is comparable to that of *Chloridea* in the western hemisphere; the latter in Tanganyika is a pest of minor importance on maize but has been noticeably severe on leguminous crops, especially *Cicer arietinum* and *Cajanus indicus*. The native custom of making maize planting unduly long, to suit upland and plain weather conditions, and dry land and swamp land soil conditions, with the consequent overlapping of planting and harvesting on contiguous or neighbouring lands, and the general disregard of uprooting and destroying crop residues on completion of harvesting, will ever, if persisted in, prove aggravating factors in the incidence of borers. The following maize pests were also recorded: the cutworm, *Laphygma exigua*, Hb., severe on the foliage of young maize; *Aphis maidis*, Fitch, and the maize hopper, *Peregrinus maidis*, Ashm., both associated with an extensive outbreak of maize streak disease.

11. *Sorghum Pests*.—*Diatraea argyrolepida*, Hmps., is also the sorghum borer of the Territory and as the types of sorghum generally planted by the natives take from six to seven months to come to maturity, the stems are exposed to possible borer infestation for a protracted period. Quick-maturing sorghums (Darso, Milo, etc.) which have been on trial and which mature their crop in from three to four months, while escaping *Diatraea* infection to a marked extent and proving highly resistant to sorghum head smuts (para. 4 (e)) have a soft type of grain which is immediately attacked by Angoumois Grain Moth, *Sitotroga cerealella*, Ol., and Grain Weevil, *Calandra oryzae*, L. The compact seed-heads of these types (as compared with the native types with open panicles) attract moth and weevil in the field prior to harvesting, and grain comes to the store already infested. Other insect pests recorded on sorghum were: the cutworm, *Laphygma exempta*, Wlk., feeding on foliage of young sorghum; *Aphis maidis*, Fitch, on young sorghum; and the sorghum maggot, *Atherigona* sp., (Anthomyidae). The maggot is responsible for "dead-heart" in young sorghum, leading to profuse tillering; and such heads from the

tillered base as escape the successive generations of the maggot fly are small and produce little if any grain. The maggot is noticeably severe on late-planted sorghum and is also a serious pest of proso millet (*Panicum miliaceum*) grown as a dry-season or short-rains crop.

12. *Rice Pests*.—An examination of stem-boring caterpillars of rice showed that *Sesamia calamistis*, Hmps., is the only species present in the rice fields of the Central Area. The incidence is never unduly heavy but could be reduced were rice stubbles hoed over after crop and the residues collected in piles and burned to destroy the pupae. Pupation generally takes place in the heel of the rice stem. *Sesamia* in rice is parasitised by *Pristomerus* sp. (Ichneumonidae) and *Rhogas* sp. and *Bracon* sp. (Braconidae).

13. *Sugar-cane Pests*.—*Busseola fusca*, Fuller, is the insect responsible for such examples of cane boring as have come to attention. Bored and unmarketable canes are invariably left by natives in the fields and the pest is thus given every possible chance to maintain itself. No further reports of the cane scale, *Aulacaspis tegalensis*, Zehnt., have been received, and this pest would appear to be confined to the sugar-cane lands of the Pangani River.

14. *Tobacco Pests*.—The only pest observed during the year was the stem borer, *Phthorimaea heliopa*, Lw., which, however, confined its work to old tobacco stems or suckers, entering by the tip of a high leaf axil. The custom of keeping old tobacco plants about native compounds should be discouraged, as such plants are bound to form a source of pests for the field tobacco.

15. *Sim-sim Pests*.—Attention was given to the pests attacking this crop and the following were recorded: *Phrycodus hystrix*, Germ. (Pentatomidæ) puncturing the seed capsules; *Aphthona bimaculata*, Jac. (Halticidae) eating the foliage; *Myzus persicae*, Schr. (Aphidae) sucking the growing tips; and a lepidopteran leaf-webber, probably *Antigastra catalunalis*, Dup., which binds the growing tips and causes terminal distortion of the plants. None of these pests has been observed seriously to damage the crop.

16. *Sunflower Pests*.—The following are the pests observed on this possible newly useful crop: *Prodenia litura*, F., feeding on the foliage; *Chloridea obsoleta*, F., feeding on the young seed heads; *Epilachna punctipennis*, Muls. (Coccinellidae) feeding on the foliage; and *Hilda patruelis*, St. (Tettigometridae) colonised by ants at the leaf axils and puncturing the stems. It is not anticipated that the possible damage by insects to this crop will be serious.

17. *Coffee Pests*.—Permitting trees to overbear is still the chief form of neglect by planters everywhere. The natural conditions in the northern coffee area of the Territory tend to throw trees into premature bearing, and satisfactory means must be adopted of correcting this. At twelve months in the field, a fly-crop is borne and trees at twenty-four months yield from 3 to 6 lb., of parchment coffee. The effect is disastrous: the trees thus reduced in vitality show extensive die-back and are predisposed to borer and Hemileia. The effect is the more accentuated as little manuring or cover-cropping is so far done by the non-native planter. In comparison, the satisfactory standard of health in the native fields is in a large measure attributable to the happy combination of live-stock raising and coffee husbandry which permits of periodic applications of manure to the coffee fields. Coffee thrips, *Physothrips xanthoceros*, Hood, was again on the verge of effecting considerable damage to the coffee crop in the lower altitudes in March, when the break of the rains saved the situation. It is astonishing that few planters, if any, stand prepared with chemicals to combat this pest. Thrips is present in the plantations throughout the year though in negligible numbers, and after the short blossom rains of November and December the small islands of infection should be looked out and sprayed with lime-sulphur to prevent or considerably decrease the later general heavy infection brought on by the dry, hot period previous to the big rains. Considerable success has attended the use of the poison syrup against the coffee bug, *Antestia variegata*, Thnbg. (see Report 1924-5, para. 18). The spray has been adopted as the standard control of coffee bug throughout the coffee areas. Such instances of injury as have come to attention have resulted from careless heavy application. A flick of the spray over the tree or the blowing of the spray into the air, thus allowing it to be carried along with the breeze over the coffee, is all that is required. The former expensive and ineffective method of handpicking the bugs has been entirely given up. The dusty ground beetle, *Gonocephalum simplex*, F., is responsible for much of the barking of newly set-out coffee formerly attributed to cutworm. The beetles work behind the cutworm shields, sometimes in considerable numbers. Paris Green-Bran bait (1 lb. to 60 lb.) mixed slightly damp and applied round the trees preferably in the evenings is recommended. Coccids as a family occupy a very minor position as pests of coffee in Tanganyika. The following are recorded: *Lecanium viride*, Green; *Lecanium elongatum*, Sign.; *Pseudococcus perniciosus*, N. & W.; *P. virgatus*; *Cerococcus hibisci*, Green; *Ceroplastes*, two species; *Saissetia hemisphaerica*, T.T. *Pseudococcus citri* (?) the form which has been the subject of special investigation in Kenya has not been observed to occur in Tanganyika. Green Scale (*L. viride*) is attacked by the predatorial noctuid *Eublemma costimacula*, Saalm., by a minute hymenopteron, and by the fungus, *Cephalosporium Lecanii*. When severe on young coffee lime-sulphur (1 to 15) can effect eradication. The other species listed are of rare occurrence. Where soil and weather conditions are satisfactory for coffee, and care is exercised to permit the trees to suffer no set-back from overbearing, white borer, *Anthores leuconotus*, Pasc., can be satisfactorily held in check by the simple operation of removal of the grubs from the galleries by means of a wire with a recurved point. Where, however, coffee is neglected or where the flow of sap or the general tone of the trees is unsatisfactory (for example in the low altitudes) borer will give considerable trouble for keeping numbers down. Coffee in such areas, unsuitable by nature, should be abandoned. Coffee in the higher altitudes



is seldom if ever attacked by Anthores. While Anthores is generally distributed throughout the coffee areas of the Territory, the yellow borer, *Nitocris usambica*, Kolbe, would appear to be confined to the western Usambaras and to attack coffee which is in a neglected condition. *Apate monacha*, F., the adults of which bore in the coffee stems, is rarely troublesome. The bean borer, *Stephanoderes hampei*, Ferr., is still confined to Bukoba.

#### 18. Cotton pests.—

##### QUARANTINE AREAS:—

- (a) Pink bollworm was reported from Northern Nyasaland and the adjoining Rungwe District of Tanganyika by the Entomologist, Nyasaland; and cotton growing discontinued in that area.
- (b) Inspection by this office in 1925 showed that active pink bollworm still existed on cotton plants in and around Tabora township, which had not been uprooted in accordance with the quarantine proclamation of 1924. The Tabora quarantine area is now a ten-mile zone with Tabora town as its centre.

The situation as to the cotton weevil, *Apion xanthostylum*, Wagn., remains satisfactory. As a result of strict attention to thorough uprooting of plants at the conclusion of the cotton season, the pest is now a rarity in the fields. The pink scavenger worm referred to in the Report, 1924-5, para. 19, has been identified by Merick as *Pyroderces coriacea* and the leaf-miner as *Acrocercops bifasciata*, Wals., not *Gracillaria* sp., as referred to in German literature. *Argyroplote leucotreta*, Meyr., reported as a cotton boll pest in Uganda, has been bred from pomegranate and custard apple but there is so far no record of its breeding in cotton even in proximity to these fruit trees. *Diparopsis castanea*, Hmps., the red bollworm or Sudan bollworm, was submitted from the Rungwe District adjoining Nyasaland where cotton cultivation was taken up in the 1925 season for the first time since British occupation. The pest does not occur in the main cotton-growing sections of the Territory. The black chrysomelid beetle, *Syagrus rugifrons*, Baly., was reared from grubs attacking the underground stem of cotton in the Morogoro Agricultural Station. These grubs, were they present in numbers, would be capable of considerable damage and would be difficult to control but for the present *Syagrus* has not become important. Another species, *S. morio*, Har., was recorded in the Report for 1922. The adults of this latter species feed in cotton foliage. *Retithrips aegyptiacus*, Marchal, is to be found on cotton generally throughout the Territory, but appears to occur in destructive numbers only when cotton is grown in hot, dry exposed conditions. Under such conditions, it attacks foliage and bolls and very often only the bare twigs and stems are left on the plants. The young stages of this thrips can readily be recognised as they are a vivid red in colour.

The season of 1925 was remarkable for the serious increase in cotton stainer on the crop. The effect of the generally inadequate preparation of the soil was clearly shown in such a season of light rainfall. Coupled with this came the overcast, sunless weather of May and June, and plants could not in their condition open their bolls satisfactorily. The amount of bad boll material in the fields presented ideal conditions for the rapid multiplication of stainers. It is hoped that the poison syrup found so successful against coffee bug may with adaption be found equally successful against *Dysdercus*, and experiments are in train.

The incidence of pink bollworm was extremely variable even in neighbouring plantations; the end-of-season figures varied between infections of 6 and 40 per cent. in locules of bolls. The number of worms per boll was low. It may now be stated that the principal point requiring investigation in the biology of the pink bollworm in the Territory is the method of aestivation. Twin-seeding, or prolonged aestivation shut up in a seed-mass as has been observed to prevail in Egypt, is unknown in the Territory; and seed from the early cotton markets as distributed for planting in late January and February is from the practical point of view free from bollworm. The few worms that have been found are limp and contracted, and efforts to induce them to feed and bring them to maturity have so far failed. At the conclusion of the season, mature or almost mature worms in the uprooted plants leave almost immediately for pupation in the soil and at time of possible burning, that is seven to ten days after uprooting, a few if any live worms remain in the bolls. Immature worms which attempt to remain in the bolls to feed are killed under the conditions of the hot, moist bolls. Cotton rubbish swept up from the fields shows no trace of pink bollworm. Pupae from end-of-season worms have in the insectary emerged as short-cycle imagoes. It is considered that the period between crops may be bridged by this insect in two ways: (a) by aestivation under certain soil conditions as yet unknown; or (b) by breeding in some wild host plant or plants as yet undiscovered. The absence of the twin-seed, long-aestivating forms simplifies the investigation and the problem in the Territory. Altogether it is felt in the light of what is already known of the pest that by such closer study as will be possible with augmentation of staff, methods will be readily devised for bringing pink bollworm under a considerable degree of control. As in the past, however, attention must continue to be paid to:—

- (1) Strict observance of the cotton "dead season."
- (2) Selection of quick-maturing cottons.
- (3) Sunning of seed-cotton on racks over fowl runs or surfaces isolated by furrows containing oil or water.
- (4) Expedition between picking and ginning: ginning should be preceded by treatment in an efficient opener or beater to remove worms free in the seed-cotton, and the rubbish thus collected systematically burned.
- (5) Immediate bagging and storage of seed.
- (6) Destruction of bolls by the feeding of stock at the conclusion of the crop, and a general clean-up in the fields.

A. H. RITCHIE,  
Entomologist.

## APPENDIX VII.

## REVENUE, FINANCIAL YEARS 1924-25, 1925-26.

	1924-25		1925-26	
	Shs.	Total, Shs.	Shs.	Total, Shs.
Receipts from Government Plan- tations:—				
Dodoma ... ..	70.00		100.00	
Tabora ... ..	462.39		571.72	
Morogoro ... ..	753.08		151.70	
Lushoto ... ..	972.20		381.60	
Mahenge ... ..	51.00		169.00	
Tanga ... ..	39,763.00		37,631.10	
Bagamoyo ... ..	16,028.00		18,717.25	
Utete ... ..	670.00		828.71	
Lindi ... ..	826.33		300.00	
Mikindani ... ..	442.00		160.80	
Kilwa ... ..	280.92		192.90	
Kigoma ... ..	474.92		920.53	
Kilosa ... ..	238.00		411.00	
Pangani ... ..	1,754.15		1,223.00	
Dar es Salaam ... ..	28,007.00		25,275.00	
Kasanga ... ..	76.87		64.00	
Mwanza ... ..	350.00		653.88	
Miombo Govt. Farm ... ..	1,000.00		1,000.00	
Mafia ... ..	888.58		840.50	
		93,108.44		89,592.69
Miscellaneous Sales of Produce and Planting Material:—				
Amani Institute ... ..	2,413.80		1,797.70	
Mpanganya Agrl. Station... ..	2,252.13		1,967.68	
Morogoro Agrl. Station ... ..	117.46		147.80	
Botanical Gardens, Dar es Salaam	38.50		39.50	
Headquarters Office, Dar es Salaam ... ..	424.26	5,246.15	179.90	4,132.58
Total ... ..		98,354.59		93,725.27









